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HAZARDS IN REUSE OF DISPOSABLE DIALYSIS DEVICES

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TO THE

SPECIAL COMMITTEE ON AGING
UNITED STATES SENATE

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FOREWORD

On March 6 of this year, witnesses testified before the Special Committee on Aging that thousands of kidney dialysis patients may be exposed to unnecessary and life-threatening risks through the multiple reuse of disposable dialysis devices. We also learned that reuse of these plastic throw-away devices is standard practice in more than half of this nation's 1,300 dialysis clinics--not because clinical study has shown it to be the safest and most effective procedure--but because it is the most profitable.

While there appears to be no consensus among experts as to the ultimate safety of reuse, there is consensus that safety cannot be assured without proper standards. By standards, we mean answers to such questions as: How many times can a dialyzer blood filter or blood tubing be reused before cracking, blood clotting or harmful chemical residue deposits occur? Five, 10, 20 or 50 times? In some clinics, these disposable items--dialyzer filter, blood tubing, transducer filter and dialyzer caps--labelled by manufacturers for "single use only" are reused more than 40 times.

Since the Committee's hearing in March, it has become clear that some patients subjected to reuse are falling victim to extremely poor and ill-defined procedures. Outbreaks of infection among patients in California, Florida, and Georgia underscore again the serious lack of quality control in many clinics. Ironically, these clinics had switched from using the potent toxin, formaldehyde, to chemicals believed to be safer in sterilizing the disposable devices for reuse. At least two of these clinics reportedly have returned to using formaldehyde, a cancer-causing chemical and one that can cause rejection of kidney transplant.

Moreover, we have learned since the March hearing that testimony of the Public Health Service, assuring Congress and the public that "no health hazards for dialyzer reuse have been demonstrated," was flawed. In the words of the Public Health Service witness himself, the testimony contained "serious omissions and inaccuracies."

Indeed, this staff report chronicles a very disturbing collection of events brought about by ill-conceived and defective decisionmaking that, at best, is attributable to expediency and, at worst, to benign neglect. Whatever the cause, it is incumbent upon the Department of Health and Human Services to initiate a concerted effort toward ensuring that all dialysis patients receive safe and effective treatment. Surely, this nation's 80,000 dialysis patients are deserving of no less.

Recent action by the Assistant Secretary for Health in establishing an Interagency Task Force within the Public Health Service to review the reuse issue is encouraging. This staff report will be forwarded to the Task Force for consideration.

We can not, and we must not, continue to accept and tolerate the seemingly endless "pass-the-buck" actions by the responsible federal agencies. Nor should any dialysis patient be placed at risk for lack of standards and protections essential to safety and efficacy in treatment.

It is, therefore, my sincere hope that the Secretary of the Department of Health and Human Services will give serious consideration to the findings and recommendations contained in this report.

JOHN HEINZ
Chairman

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HAZARDS IN REUSE
OF DISPOSABLE DIALYSIS DEVICES

A Staff Report
to the
Special Committee on Aging

United States Senate
John Heinz, Chairman

EXECUTIVE SUMMARY

INTRODUCTION TO THE EXECUTIVE SUMMARY.

This report summarizes the findings of a ten month investigation by Committee staff, which began with an inquiry culminating in the Committee's March 6, 1986 hearing, entitled "Disposable Dialysis Devices: Is Reuse Abuse?", and now encompasses an additional six months of intensive post-hearing follow up. In the course of this investigation, interviews and sworn depositions were conducted with scores of analysts and officials of the Public Health Service. In addition, staff catalogued and analyzed thousands of documents generated over the past ten years by Governmental and private entities concerned with reuse of disposable medical devices, particularly dialysis devices.

BACKGROUND.

More than half of this nation's 1,300 dialysis clinics are subjecting their patients to reuse of reprocessed dialysis devices that are designed and labeled by manufacturers for "single use only". These devices, through which the patient's blood passes for removal of life-threatening toxins, are reprocessed and reused as many as 40 to 50 times. Approximately 48,000 individuals are dialyzed several times weekly with reused dialyzers, bloodlines, and related devices.

Reprocessing of the disposable devices in these clinics involves flushing out the device after each reuse with a disinfectant solution (usually 2% to 4% formaldehyde or some other chemical), which is intended to sterilize the device for its subsequent reuse. Failure to properly sterilize these devices results in bacterial contamination. Bacterial infection is a very serious threat to dialysis patients because they often suffer from anemia, and are sickly and frail.

Additional hazards to the patient in reuse are potential harmful effects from the disinfectant chemicals themselves. For example, formaldehyde, which is used as the disinfectant in approximately 85% of those clinics practicing reuse, is a known carcinogen, and can cause severe allergic reaction, liver damage, anemia, central nervous system disorders, destruction of red blood cells, reproductive disorders, and kidney transplant rejection. Studies have shown that residues of formaldehyde remain in the devices following reprocessing, and that these residues leach out directly into the blood of dialysis patients.

On August 15, 1986, the Health Care Financing Administration (HCFA), acting upon assurances from the Public Health Service that reuse is safe and efficacious, published a final rule to reduce the base rates paid to dialysis clinics by as much as $7 per treatment. The rate reduction, which became effective October 1, 1986, will provide additional incentives for dialysis centers to reuse devices if they are not already, and to increase the number of reuses per device in centers in which reuse is already practiced.

STAFF FINDINGS

FINDING I: Hazards in reuse of disposable dialysis devices have caused deaths, serious injuries, and costly hospitalization of patients.

- These dangers are evident from past experience with dialysis devices, as well as with devices other than dialysis equipment.
- Since the March 6, 1986 hearing of the Committee on this subject, outbreaks of bacteremia have occurred in at least seven dialysis clinics that reuse disposable devices, resulting in the hospitalization of many frail dialysis patients, and the death of one patient.
- Investigations of these outbreaks by the Centers for Disease Control (CDC) have clearly demonstrated a positive link between a higher number of reuses of dialysis devices and a higher risk of blood infection.
- CDC's investigations implicated poor reprocessing practice and procedure in several of the dialysis clinics where these outbreaks occurred.
- The Public Health Service (PHS) assurance that reuse is safe if practiced safely, ignores a substantial body of evidence developed by CDC and FDA investigators which indicates widespread unsafe reuse practices in clinics.
- Large numbers of patients are unnecessarily exposed to the risks of reuse, in the name of preventing "First-Use Syndrome", while their preventable dialyzer hypersensitivities go untreated.

FINDING II: Dialysis patients are left unprotected by the absence of uniform enforceable Federal standards, and by inadequate and deficient voluntary guidelines, needed to promote safety and efficacy in reuse.

- The Public Health Service and FDA have repeatedly refused to promulgate enforceable standards for reuse.
- Existing voluntary guidelines provide inadequate protection to dialysis patients.

FINDING III: FDA and HCFA have shirked their responsibility to enforce existing rules meant to ensure safety, efficacy, and quality of care in dialysis centers.

- In 1981, FDA substantially weakened its compliance policy in regulating reuse of disposable devices, removing the threat of prosecution for reuse of disposable medical devices.
- FDA has failed to apply existing regulatory authority to the reprocessing of disposable medical devices.
- Since 1981, FDA has conducted only a handful of field inspections relating to reuse of disposable dialysis devices.
- Because of a shrinking budget, FDA would like to shift responsibility for inspection of dialysis clinics to HCFA, but that agency has severe budget problems also and is inspecting fewer than 60% of clinics each year.
- HCFA promised the Committee in June 1986 to enforce the law prohibiting clinics from forcing patients to reuse, but has since refused to protect patients from forced reuse.

FINDING IV: The Public Health Service failed to gather data needed to determine the safety and efficacy of reuse.

- The PHS' failure to gather data essential to determining the safety and efficacy in reuse of disposable dialysis devices stems primarily from a decision in early 1981 to discontinue a congressionally mandated study.

- CDC's annual survey of dialysis clinics depends upon voluntary responses, has never been validated, and fails to include any specific questions on the incidence of infection in patients subjected to reuse.

- CDC's epidemiologists most familiar with reuse of medical devices have concluded "the data base concerning safety and appropriateness of reusing disposable hemodialyzers is currently inadequate to make a scientific assessment" of the safety of reuse.

FINDING V: PHS relied on flawed studies, and malinterpreted its own data to assert that reuse is safe and efficacious.

- The 1982 NIH-funded report, relied upon by PHS officials, HCFA and the Executive Office of Management and Budget to establish the safety and efficacy of reuse, is lacking in substantive factual data to support its key conclusions.

- PHS' assessment of the safety and efficacy of reuse repeatedly cites a single 1986 study without qualification, ignoring fundamental flaws in its methodology and conclusions that were established at the March 6, 1986 hearing of the Senate Aging Committee.

- In testimony on March 6, and in a briefing book prepared subsequently for the Assistant Secretary for Health, PHS falsely cites FDA's 1980 "Investigation of Risks and Hazards Associated with Hemodialysis Devices" as stating that no standards for reuse are needed, and that there is no increased risk associated with reuse. The report in fact stated, "standards cannot be proposed" in the absence of definitive studies and because manufacturers label these devices for "single-use only". In addition, the report does cite evidence of risks as well as hazards associated with reuse.

FINDING VI: PHS has consistently misled the Congress, HCFA, the dialysis community and the public on the safety of reuse.

- PHS has repeatedly answered letters from dialysis patients, their organizations, and Members of Congress with assurances of the safety of reuse which are contradicted by information in the possession of PHS.

- PHS' testimony before the Senate Special Committee on Aging was "flawed" and contained "serious omissions and inaccuracies", according to the PHS witness himself.

- As a matter of policy, the DHHS has elected not to impose upon dialysis clinics FDA's existing Good Manufacturing Practice regulations (GMPs), but informed the Committee on April 29, 1986 that the law would not permit imposing the GMPs on clinics.

- CDC's June 1986 publication of the findings of its investigation of outbreaks of bacteremia was edited to remove accurate statements and conclusions because they conflicted with the policy presented at the Special Committee on Aging hearing in March 1986.

- On the eve of the publication of the OMB/HCFA dialysis reimbursement rate reduction, PHS mislead HCFA by advising that agency that reuse has no impact on patient outcomes, and that virtually all dialysis facilities are following adequate procedures.

FINDING VII: The Public Health Service assessment of the safety and efficacy of reuse is flawed and incomplete.

- PHS incorrectly assumed at the outset of the assessment that "nothing new" would be found that had not already been considered for the March 6 hearing testimony.

- NCHSR/HCTA was given an unreasonably short deadline for completing the assessment, less than half the time normally allotted for a health technology assessment.

- During the course of the assessment, FDA and CDC did not respond in a timely manner to requests from NCHSR/HCTA for information and data pertaining to deaths, serious injuries, malfunctions, and poor practice and procedure associated with reprocessing and reuse of disposable dialysis devices. Most of these materials were not received until after the assessment had been prematurely terminated.

- Premature termination of the assessment accommodated the OMB/HCFA timetable for publishing dialysis reimbursement rate reductions on August 15.

- Prior to publication of the reimbursement rate reductions, PHS falsely assured HCFA that there were no serious hazards associated with reuse.

RECOMMENDATIONS

1. Until further information is available, providers of dialysis services who reuse "single use only" dialyzers, should review their practices and experience and assess whether alternatives to one-time use of disposable dialyzers are appropriate and optimally beneficial to patients.

2. The Secretary of DHHS should direct the Public Health Service to undertake a thorough, objective, and complete health technology assessment of the problems associated with reuse.

3. The Secretary should direct the Centers for Disease Control to follow the recommendation of its epidemiologists, and immediately initiate a comprehensive investigation of a national sample of dialysis clinics to determine the extent of poor practice and procedure in reprocessing and reuse.

4. The Secretary of DHHS should direct the FDA to promulgate uniform, enforceable federal standards to promote safety and efficacy in reuse of disposable dialysis devices, as well as all other disposable medical devices that are reprocessed for reuse.

5. The new DHHS Interagency Reuse Task Force should give thorough and serious consideration to the findings and recommendations contained in this report when formulating a policy for the reuse and reprocessing of dialysis devices.

6. The Task Force should be expanded to include representatives of dialysis patients, clinicians, and device manufacturers who favor reuse, and other representatives from these groups that are opposed to reuse.

7. HCFA should immediately withdraw its regulation for reducing Medicare's dialysis reimbursement rates, so as not to encourage or force an increase in the reuse of dialysis devices.

8. The FDA should require that dialysis clinics that practice reuse abide by the requirements of the Good Manufacturing Practices in accordance with, and as provided for, in existing law and regulations.

9. The Secretary of DHHS should require that controlled preclinical and clinical studies be performed to assess the dangers associated with the reuse of all dialysis devices, including the dialyzer, blood tubing, dialyzer caps, and transducer filter.

10. The Secretary of DHHS should direct HCFA to enforce the patient's rights provisions of the Medicare conditions of participation, to protect the legally guaranteed rights of dialysis patients.

11. DHHS should require dialysis clinics to inform their patients in writing about the risks associated with reuse and reprocessing, and allow the patients the freedom to choose whether or not to reuse their dialysis devices.

12. HCFA should direct all clinics to stop reusing blood lines and tubing, transducer filters, and dialyzer caps, under penalty of decertification of the facility, because of the total lack of standards, voluntary guidelines, or even data regarding safety and efficacy, for reuse of these devices.

INTRODUCTION

This report by the staff of the Special Committee on Aging contains findings and conclusions based on ten months of investigation and on testimony presented during the Committee's March 6, 1986 hearing, "Disposable Dialysis Devices: Is Reuse Abuse?".

The purpose of this report is threefold: (1) to inform the Administration and the public at large of the potential dangers in reusing disposable dialysis devices under existing conditions; (2) to expose the fundamental deficiencies in the U.S. Public Health Service's (PHS) recent health technology assessment of the safety and efficacy of reuse; and (3) to correct the record of the March 6 hearing, which contains seriously flawed testimony by PHS witnesses.

More than half of this nation's 1,300 dialysis clinics subject their patients to reuse of reprocessed dialysis devices that are designed and labeled by manufacturers for "single use only." Although many of the more than 600 clinics practicing reuse may be employing adequate procedures to ensure safety, there is no database -- qualitative or quantitative -- to identify those clinics that do, as opposed to those that do not. What is certain is that most dialysis patients are unable to determine on their own whether reprocessing/reuse procedures in their clinics are safe and efficacious.

Adding to this uncertainty is the fact that there are no enforceable uniform federal standards for reprocessing and reuse, nor does there even exist a comprehensive set of voluntary guidelines for these procedures. This lack of standards or adequate guidelines is further compounded by the absence of any provision for verifiable quality control, as well as there being no requirement for clinics to report accidents, injuries -- or even deaths -- that may be caused by faulty reprocessing/reuse practice and procedure. Consequently, an undetermined number of clinics practicing reuse may be exposing their patients to potentially dangerous, and sometimes life-threatening, risks.

Unfortunately, some clinics make it a practice of threatening their patients with dismissal if they refuse to submit to reuse. Clinics that force reuse directly violate federal regulations that provide for patients' rights, including prohibiting the transfer or discharge of patients by clinics for any reason other than medical, for the patient's welfare or that of other patients, or for nonpayment. Testimony at the March 6 hearing established HCFA's failure to enforce the patients' rights regulation.

End Stage Renal Disease (ESRD) patients on dialysis are extremely vulnerable to the dictates of clinic managers and physicians. Loss of kidney function requires most patients to undergo four hours of treatment on a dialysis machine three times a week for the rest of their lives, or until the patient receives a successful kidney transplant. Dialysis patients often suffer from anemia and other debilitating medical complications as a result of kidney function loss. These often very frail patients are particularly susceptible to contracting bacterial infections, a risk inherent in reprocessing disposable devices without adequate procedure for ensuring safety. In one Louisiana clinic, 15 patients died from a virulent bacterial infection in 1982 after reusing their disposable devices.

Most often reused -- as many as 40 and 50 times -- is the dialyzer, the filter through which the patient's blood flows for removal of toxins, and excess salt and fluid. An increasing number of clinics are also reusing the connecting blood lines, transducer filters and dialyzer caps.

Reprocessing in these clinics is performed by a "technician," who "sterilizes" the device by flushing it with a disinfectant solution. A 2% to 4% formaldehyde solution, or some other chemical, is used in the "sterilization" process. The dangers of improper sterilization are clear: bacterial contamination, which can, and often does, result in patients suffering life-threatening infections and other complications.

An additional, but as yet unstudied, issue is the potential for the disinfectant chemical to cause harmful effects. For example, formaldehyde, the disinfectant used in 85% of those clinics practicing reuse, is a known carcinogen, and can cause severe allergic reaction, liver damage, anemia, central nervous system disorders, destruction of red blood cells, reproductive disorders, and kidney transplant rejection. Studies show that residues of formaldehyde remain in the devices following reprocessing, and that these residues can leach out directly into the blood of dialysis patients.

In 1978, the Congress mandated that the Department of Health and Human Services (DHHS) conduct a study to determine the "appropriateness and safety" of reuse. The National Institutes of Health (NIH) contracted for a limited study of the effects of reprocessing and reuse on the dialyzer filter. Some of the test results were inconclusive. Inexplicably, the NIH also cancelled that portion of the study which included clinical study to determine how reuse affects the patient. To date, the practice of reusing disposable dialysis devices has never undergone such controlled clinical study.

Reuse is driven by financial -- not medical -- incentives. For example, each time a clinic reuses a $12.00 dialyzer filter, it saves from one-third to as much as one-half the cost of a new one. A Congressional Office of Technology Assessment study found that clinics practicing reuse garner $80 million per year in excess profits through reuse of dialyzer filters alone.

The Committee staff's post-hearing, follow-up investigation over the past seven months included the gathering and analysis of thousands of internal records and documents generated by the Food and Drug Administration (FDA), the Centers for Disease Control (CDC), HCFA, the National Center for Health Services Research and Health Care Technology Assessment (NCHSR/HCTA), the Office of the Assistant Secretary for Health, and the Office of the Secretary of DHHS. Committee staff also conducted interviews with scores of officials and personnel within these agencies, followed by a battery of sworn depositions involving individuals from FDA, CDC, and NCHSR/HCTA, the PHS agency which had conducted an assessment of the safety and efficacy of reuse following the Committee's March 6 hearing.

This report presents the facts as they were discovered, identified and established during the investigation by Committee staff.

SECTION I:

HAZARDS IN REUSE OF DISPOSABLE DIALYSIS DEVICES HAVE CAUSED DEATHS, SERIOUS INJURIES, AND COSTLY HOSPITALIZATION OF PATIENTS

Overview.

While the safety and efficacy of reuse of disposable dialysis devices have been the subject of considerable debate, it is indisputable that serious injury and death can and does occur when reprocessing of these devices is performed improperly. Given the clear threat posed by improper reprocessing of medical devices, the Congress and the Department of Health and Human Services (DHHS) must answer the question: is the reprocessing and reuse of disposable dialysis devices, as presently practiced and regulated, safe and efficacious?

Evidence of widespread poor practice in reprocessing and reuse has repeatedly surfaced in recent years. Committee staff combed through thousands of Public Health Service (PHS) records at FDA and CDC to obtain a closer approximation of the true extent of adverse patient outcomes associated with dialysis and reprocessing of devices used in dialysis.

Staff study of these records reveals that dialysis clinics have failed to safely reuse because of their failure to appreciate and prepare for the added burdens and complexities for facility practice and procedure necessitated by reprocessing and reuse. Problems generally arose because of a failure in one of the following four key areas: (1) water treatment, (2) disinfecting devices after use, (3) dialyzer and reprocessing machine integrity, (4) unnecessary exposure of patients to the risks of reuse.

Evidence of poor practice and procedure.

One of the few objective studies of dialysis facility practice and procedure performed to date was submitted to FDA in "draft final" form in August 1985 by the California Department of Health Services. The study, performed under FDA contract and entitled "California Dialysis Facility Study", is based upon site visits and "oral and written information voluntarily provided" by 31 randomly selected dialysis centers (eleven hospital-based and twenty free-standing units) in that State.

The California study was not intended to focus on reuse in particular, but to examine dialysis practice and procedure in general. Nevertheless, the most serious problems and the most pointed criticisms in the report are found in its section devoted to reuse of disposable dialysis devices. In identifying these problems, the investigators discovered that the center managers and employees "appeared to be satisfied", though their procedures and practices were egregiously flawed:

> ". . . All dialysis facilities appeared to be satisfied that they were providing safe and effective reprocessed dialyzers. . . However, the observation that facilities are frequently not adhering to their protocols, and the general lack of quality control and assurance procedures indicates that at least some of the reuse programs are not operating in a state of control. . ."[1]

Contributing to the facilities' ignorance of their own deficiencies is the fact that the personnel performing key reprocessing tasks in some clinics are not required to have extensive background or experience in their work. The California study noted

> ". . . [f]ive facilities have. . . a separate job classification for reuse. The reuse technician's responsibility is to reprocess

dialyzers and to maintain reuse equipment. Educational requirements for this position, when specified, were minimal. For example, one facility's requirement was that the person be at least 16 years of age and be able to read and write English."[2]

The reality of poorly qualified facility employees performing reprocessing of intravascular dialysis devices contrasts sharply with the image of reprocessing as "medical practice" projected by many proponents of reuse.

The FDA "Dialysis Use Committee" identified potential and actual patient injuries and deaths that can occur because of improperly trained and supervised clinic employees. Two such incidents were described in an attachment to the Dialysis Use Committee's October 1984 report to FDA leadership:

o "PROBLEM: Incorrect Hookup Of Disinfectant Lines.

CLINICAL CONSEQUENCES: 1) Severe hemolysis and death, 2) toxic reaction.

DESCRIPTION OF PROBLEM: 1) In one incident, bleach was added to the concentrate reservoir on a multiple patient (batch) delivery system. The event occurred during dialysis and was due to human error. The system lacked a safety interlock. The patient suffered severe hemolysis and died. 2) In the second incident, the concentrate line was inserted into the disinfectant reservoir during dialysis. The event resulted in a 'possible' toxic reaction. The system lacked a safety interlock and the event was due to human error."

o "PROBLEM: Overriding Alarm Systems.

CLINICAL CONSEQUENCES: When the dialysate concentrate is depleted, insufficient electrolytes are delivered to the patient. . . clinical consequences to the patient may include severe cramping, muscle spasm, incoherence, hypertension, hemolysis, and ultimately, death.

DESCRIPTION OF PROBLEM: (a) The concentrate reservoir of a single patient dialysate delivery system emptied. The. . . alarm was activated automatically, but a staff member overrode it. The patient's blood was severely hemolyzed (hematocrit decreased from 20 to 8) and dialysis was terminated. The patient recovered mainly due to transfusion and prompt initiation of proper dialysis. (b) Four patients were on a dialysate delivery system whose proportioning pump malfunctioned. . . alarm was bypassed by the staff. Three of the four patients died of massive hemolysis. . .

ANALYSIS OF PROBLEM: In all cases, the conductivity meter alarm was overridden by the operator; thus, the problem was compounded by human error. . . dialysis staff. . . should be educated to monitor the conductivity level whenever the monitor is overridden due to false alarms."[3]

Unfortunately, FDA did not provide a copy of the October "Dialysis Use Committee" report and its attachments to the authors of the PHS assessment report, so these findings could not be included in the assessment. In addition, the FDA-funded California "Dialysis Facility Study" was not forwarded to FDA until August 12, 1986, by which time PHS had already determined the assessment was complete. As a result, these and other findings of the California study reported herein were not incorporated in the assessment.

Disinfection of reused dialysis devices: walking a fine line.

Reprocessing involves flushing out the device after each reuse with a disinfectant solution (1.5% to 4% formaldehyde or some other chemical), which is intended to sterilize the device for its subsequent reuse. Failure to sterilize these devices can result in bacterial contamination, which poses a very serious threat of infection to dialysis patients because they often suffer from anemia, and are sickly and frail.

Besides risk of infection, additional hazards to the patient in reuse are potential harmful effects from the disinfectant chemicals themselves. For example, formaldehyde, which is used as the disinfectant in 85% of those clinics practicing reuse, is a known carcinogen, and can cause severe allergic reaction, liver damage, anemia, central nervous system disorders, destruction of red blood cells, reproductive disorders, and kidney transplant rejection. Studies have shown that residues of formaldehyde remain in the devices following reprocessing, and that these residues leach out directly into the blood of dialysis patients.

Two problems immediately arise when a clinic decides to reuse, as a result of the need to somehow simultaneously avoid both inadequate disinfection and toxic residues. The clinic should use a strong solution of disinfectant, or bacteremia and death or serious injury may result. But the greater the concentration of disinfectant used, the greater the risk residual disinfectant will harm the patient and the more thoroughly a device must be rinsed to remove the residual.

In economic terms, using a higher disinfectant concentration presents clinics with increased costs for disinfectant, rinsing solution, labor, and/or reprocessing machine time. On the other hand, there may be no increased costs (accruing to the clinic) as a result of using too low a concentration of disinfectant, even if a bacteremia outbreak results.

Evidence of harm caused by improper disinfection practice and procedure.

Patients have suffered acute affects and direct bloodstream exposure to a carcinogen because the disinfectant used to sterilize dialysis devices at their clinic was not sufficiently dilute, or because residues were left behind in the reprocessed device.

In one recent instance, on August 12, 1985 a Medical Device Report (MDR) was received by FDA regarding an incident in which a

> "patient on dialysis experienced a burning sensation in his vascular access area, shortness of breath and elevated blood pressure. Dialysis was discontinued and symptoms disappeared. [The clinic] felt that this was a [disinfectant] reaction and found indications of [disinfectant] in the dialysis compartment of the dialyzer used on the patient. It was found that the dialysis technician had failed to make the pre-dilution [of disinfectant concentrate] prior to connecting the [disinfectant] concentrate to the dialyzer."

In this case, the disinfectant was a blend of hydrogen peroxide, peracetic acid, and acetic acid sold as a concentrate.

The State of California, in proposing a very low minimum concentration of formaldehyde for proper disinfection of reused devices, explained its recommendation in this way:

> "Because of the lack of knowledge regarding dialyzer formaldehyde residual levels which can be tolerated by dialysis patients, it is reasonable to make efforts to minimize patient formaldehyde exposure as much as possible. Based upon an adequately controlled and maintained water system with the final product water being supplied by a reverse osmosis system, the Department in its proposed Hemodialyzer Reuse Regulations specifies a formaldehyde concentration of at least 1.5%. . . Control measures should be instituted to minimize bioburden, including use of properly treated water, water system specification and control, and aseptic technique in the reprocessing and handling of dialyzers."[4]

In selecting a 1.5% formaldehyde solution strength, California has decided to err on the side of less exposure to formaldehyde, citing the risks of infusing that chemical into patients' bloodstream. But serious injuries and death have also resulted from use of too weak a disinfectant solution. If past experience with less than 4% formaldehyde disinfectant solutions is any guide, patients in clinics using 1.5% formaldehyde may suffer from bacterial infection of the blood.

A 2% formaldehyde disinfectant solution was in use at the Baton Rouge, Louisiana center where, during the period spanning June 1982 through June 1983, twenty-seven patients in a dialysis center in Baton Rouge were infected with rapidly growing mycobacteria. Fifteen of the patients died within a year of the outbreak. The Centers for Disease Control (CDC) reported that "one factor common to all patients was exposure to [re]processed dialyzers." The CDC hypothesized that "patients became infected when their blood circulated through [re]processed dialyzers that contained viable rapidly growing mycobacteria." CDC's investigation revealed that the Louisiana dialysis clinic had been reprocessing their dialyzers with the 2% formaldehyde solution, despite the fact that CDC had published in 1981 its finding that 4% formaldehyde solution is necessary for adequate disinfection.[5]

The problem of clinics using too weak a solution for proper disinfection was again illustrated in 1986, during CDC's investigation of infection outbreaks at two Georgia clinics, where CDC epidemiologists found:

> "the most likely source of the infections appears to be reprocessed hemodialyzers. . . both [dialysis] centers used a 40:1 dilution of [disinfectant] concentrate with product water, while the recommended dilution specified on each bottle of the concentrate is 24:1. . . the apparatus used for rinsing and filling of the hemodialyzers. . . may have allowed for additional dilution of the prepared [already over-diluted disinfectant] solution prior to its entry into dialyzers."[6]

California's Health Department, in its FDA-funded investigation of 31 randomly selected dialysis clinics, also found many facilities failed to properly handle the formaldehyde they used in reprocessing. Specific deficiencies cited in California's draft final report involve improper dilution of concentrated disinfectant and inaccurate and incomplete gauging and elimination of residual disinfectant.

> "Formaldehyde is the disinfecting agent of choice at the sites visited. Many of the facilities were unable to indicate the concentration of formaldehyde used in the disinfection process. . . Among all the quality control procedures for reuse that were observed in the sites visited, the testing for the amounts of formaldehyde disinfectant residual was the worst. . . It was felt that the depth of understanding of the principles associated with disinfectant chemical testing was seriously lacking among reprocessing technicians performing this crucial quality control test. . . Whatever the standard [for residual disinfectant tolerated in the dialyzer] employed by the facility, specifying a test suitably sensitive to the standard. . . is mandatory. Again, this was something seriously lacking at the sites observed. . . [F]acilities indicated that there were hypersensitivity reactions thought to be caused by the formaldehyde disinfectant residual."[7]

One clinic volunteered to State engineers the fact that it had so diluted its formaldehyde disinfectant solution that bacteria were growing inside the disinfectant chemical storage container. "Several" patients suffered as a result:

> "One facility indicated several pyrogenic and septicemic responses directly attributable to the reuse process. It was found that procedures for diluting the formaldehyde chemical into the useable 1.5%. . . solution were incorrect. Tests revealed that the actual concentration of the formaldehyde solution approximated 0.5 percent, allowing for bacterial growth in both the disinfectant

chemical storage container and, apparently, in the patient dialyzers themselves."[8]

The California Health Department investigators also observed questionable disinfection procedures being applied to reprocessing of bloodlines. In fact, at two facilities, the same improper disinfection practice being used for dialyzers was being applied to the arterial bloodlines:

> ". . . Arterial blood lines were reprocessed at two facilities. . . the same as for the hollow fiber dialyzers. No testing for disinfectant residuals was indicated by the facilities."[9]

These clinics were reprocessing bloodlines, despite the fact that no guidelines exist for reprocessing of bloodlines. Voluntary guidelines for reprocessing of dialyzers have been widely circulated by the Association for the Advancement of Medical Instrumentation (AAMI). AAMI's guidelines call for testing to ensure that levels of residual disinfectant are minimal. The two clinics cited above failed to adhere to the current AAMI guidelines in reprocessing either their dialyzers or their bloodlines. The willingness of such clinics to reprocess in the absence of any guidelines, and their failure to utilize recommended practice where it exists, suggests that only the imposition of enforceable standards will have an impact on the worst clinic operators.[10]

CDC investigations confirm inadequate disinfection practices have resulted in bacteremia outbreaks.

The danger of bacterial infection of the blood from improper disinfection is also evident from CDC's experience with devices other than dialysis equipment. CDC investigator John J. Murphy, M.D. expressed his doubt that reuse is safe, saying:

> "[o]ur doubt I think is based on a large amount of experience with intravascular devices and the experience that there have been other outbreaks associated with inadequate disinfection of them. By these I refer to other devices used in hospitals, intravascular transducers, intravascular catheters. And it's difficult to disinfect these devices, and when you have a day-to-day operation there's frequently problems or inadequacies in disinfecting them."[11]

In addition to this previous experience with intravascular devices, generally, during 1986 CDC learned a great deal about problems experienced by clinics attempting to disinfect dialysis devices, specifically. Between March 24 and August 9, 1986, CDC and FDA became aware of a rash of outbreaks of bacteremia and pyrogenic (fever-inducing) reactions affecting dialysis patients in seven clinics in four States. Reflecting upon his experience in investigating bacteremia outbreaks at clinics in Inglewood and Culver City, California, Jesop and Brunswick, Georgia, and Dallas, Texas, CDC Epidemiology Officer Murphy described procedural deficiencies which could cause patient injury:

> "in several of the centers we found problems with the procedures. . . For example, inadequate filling of the dialyzer [with disinfectant], deficiencies in the testing of potency of the disinfectant used to fill the dialyzer, similar problems to that."[12]

According to Dr. Murphy, the most common problem found by CDC in these investigations was

> ". . .bacteremia, bacterial infection of the patient's blood that occurred during dialysis. . . I think, yes, that the reuse of intravascular devices in these [dialysis] clinics was the major procedure that we were investigating as to the probable cause of these infections."[13]

CDC and FDA investigations show the number of uses, and materials making up the reused device, can be associated with greater risk of infection.

During an FDA-funded study of fifteen dialysis clinics in the Nation's capital, District of Columbia investigators identified a trend towards greater failure of dialysis devices where reuse is practiced:

> ". . . Occurences of blood tubing set failures (leaking, malocclusion of unions, fittings, and splitting) were higher in facilities which practice reprocessing and reuse of arterial blood tubing sets. . . The Department of Consumer and Regulatory Affairs recommends that further studies be conducted in: blood tubing reuse practice. . . and the quality and adequacy of orientation/training programs for staff in hemodialysis facilities."[14]

In fact, in the D.C. survey, in which a group of several bloodline failures were often reported by clinics to investigators as a single incident, 41 of 48 (85%) "incidents" of bloodline failures occurred in clinics which practice reprocessing and reuse. Reusing clinics numbered 6 of a total of 15 facilities in the survey (40%).

Echoing the District of Columbia investigators' findings, Dr. Murphy of CDC summarized his findings from his visit to the Inglewood, California outbreak site as follows:

> "[c]ases of intradialytic bacteremia were significantly more likely to occur among patients being dialyzed on cellulose acetate. . . dialyzers than among patients being dialyzed on other dialyzer types. . . Patients diagnosed with intradialytic bacteremia had a significantly higher number of dialyzer reuses than control patients dialyzed at the same time with the same dialyzer type."[15]

CDC was also able to establish a statistically significant positive association between multiple use of dialyzers and greater risk of contracting an infection during their investigation of the clinic in Dallas, Texas.[16] In the Culver City, California outbreak, the CDC investigator's notes indicate that patients who suffered pyrogenic reactions were using dialyzers that had been reused 9, 12, and 13 times, which was a higher average number of reuses than that of patients who did not experience adverse reactions.[17]

The problems found by the State Department of Health Services study in California clinics that use formaldehyde are analogous to those involving two different alternative disinfectants to formaldehyde, such as identified by CDC, and as reported to FDA on August 12, 1986. The similarity between these incidents involving improper disinfectant practice and procedure suggests that poor practice and procedure are fundamental problems faced by all clinics that opt for reprocessing and reuse, irrespective of type of disinfectant used, and provides further evidence of the need for enforceable standards and regular inspections of these centers.

Basic facts regarding the seven known outbreaks of bacteremia and pyrogenic reactions occurring during the Spring and Summer of 1986 are summarized below.

- Inglewood, CA Outbreak. Between April 10 and May 2, 1986, four patients in a southern California dialysis center contracted bacteremia and were hospitalized after receiving dialysis treatments with reprocessed dialyzers. Prior to the outbreak, the Inglewood clinic had recently switched to a new disinfectant for reprocessing. The clinic began to dramatically increase the number of reuses per dialyzer at the that time, from a mean number of reuses of 9.6 in January 1986 to a mean number of reuses of 15.1 in April 1986, apparently motivated in part by the higher cost of the new disinfectant.[18]

Documentation of this investigation was not provided to the authors of the PHS assessment until after it was completed.

- Daytona Beach, FL Outbreak. Between March 24 and April 1, 1986, a total of seven patients became ill due to an outbreak of bacteremia and unexplained fevers. The clinic reported: "March 24th incident involved a hospitalization. March 25th incident treated at dialysis unit by registered nurses. The March 31st incident involved hospitalization. The April 1st incident was treated onsite by registered nurses. All four patients appeared to suffer a pyrogen-like reaction. . . during dialysis with hemodialyzers reprocessed with product-D sporocide. No other reports with same batch."

  Documentation regarding this outbreak was not made available to the authors of the PHS assessment until after it was completed.

- Dallas, TX Outbreaks. Between May 6, 1986 and June 9, 1986, five patients suffered adverse reactions during an outbreak of bacteremia associated with reprocessing and reuse of dialyzers. One of these patients died. CDC's discovery of this outbreak was accidental and did not occur until mid-June, when a CDC investigator happened to call the Dallas clinic administrator for expert advice on the Inglewood outbreak in California. In that conversation, the Dallas administrator disclosed that he, too, had several patients who had recently suffered from bacteremias. CDC investigators subsequently identified a second outbreak between June 12 and 16, in which three patients suffered adverse health effects during dialysis with reprocessed dialysis devices.

  Documentation from this investigation was not made available to the authors of the PHS assessment until Committee staff obtained the information from CDC and forwarded it to the NCHSR/HCTA on August 2, 1986.

- Napa, California Outbreak. On May 15, 1986, two dialysis patients were "hospitalized with spiking fever" after reprocessing of their hollow fiber dialyzers by a dialysis center. According to the Medical Device Report submitted to FDA, the clinic's dialyzer "processing method may have been either manual or automated, but it was not performed according to directions for use." CDC did not investigate this outbreak onsite.

  This Medical Device Report was not provided to the authors of the PHS assessment until August 11, after the assessment had been completed.

- Jesop and Brunswick, Georgia Outbreaks. Between May 30 and June 16, 1986, six patients at two Georgia dialysis clinics suffered adverse reactions, including bacteremia, after dialysis with reprocessed dialyzers. In their report on the incident to the Director of the CDC's Hospital Infection Program, investigators said "the most likely source of the infections appears to be reprocessed hemodialyzers". Both clinics were stretching their supply of disinfectant by diluting it beyond manufacturer specifications. The manufacturer of the disinfectant suggested additional problems were present at the centers: ". . .[i]n the Brunswick center [Reverse Osmosis water treatment] membrane failure was the most probable cause. . . [The Brunswick] operation lacks a written document for reuse. . . The current system relies on verbal instruction and the memory of the [reprocessing] technician."[19]

  Documentation from this investigation was not made available to the authors of the PHS assessment until Committee staff obtained and forwarded the information to NCHSR/HCTA on August 2, 1986. According to one of the authors of the assessment, it could not be incorporated in the assessment report.

- Culver City, California Outbreak. Between July 26 and August 9, 1986, three patients suffered pyrogenic reactions after dialysis treatment with devices reprocessed with an alternative disinfectant to formaldehyde. The clinic started using the alternative disinfectant in July, and switched back to formaldehyde on August 9, as a result of the patients' pyrogenic reactions.

  Because the PHS assessment was completed on August 6, documentation of this investigation was not considered for the assessment.

Risks of reprocessing and reuse are exacerbated because disposable dialysis devices are not designed, constructed, or labeled for reuse; while some disposables may be of questionable quality due to poor manufacturing practices.

Two additional complications arise for clinics that elect to reuse dialysis devices: (1) disposable devices are not designed for the added stress and strain of reprocessing and reuse; meanwhile, changing standards of manufacturers may make devices increasingly difficult to safely reuse; (2) automated reprocessing machines are increasingly used for flushing and sterilizing dialysis devices, in part because they reduce labor costs for the reusing clinic, but FDA has found many problems with the quality of their manufacture. Similarly, FDA has identified (with CDC assistance) poorly manufactured disinfectant, sold for use in reprocessing dialysis devices.

Manufacturers of disposable dialysis devices design, label, and produce such devices with the anticipation that they will be subjected to single use only. In response to competitive pressures in the disposable device market that work to push prices down as low as possible, manufacturers find ways to make their disposables as inexpensively as possible.

The trade association of medical device manufacturers stated the risks of reuse of disposables in this way:

> "[o]ur members are concerned about the practice of reuse of devices that are designed, manufactured, and labeled for single-use because:
>
> - the design and manufacturing decisions made with respect to these devices did not anticipate multiple uses,
> - reuse creates a double standard for quality of health care (one quality level for new devices, another level for reused devices),
> - manufacturers are often expected to assume liability when the reused product fails even when the product label warns against the practice, and
> - we suspect that in the long run, reuse does not produce cost savings. . .
>
> "There are design reasons, material reasons, sterilization reasons, production reasons, packaging reasons. . . for labeling of products as single-use. . . [The] U.S. health care system would be safer if single-use devices could be prevented from being reused. . . If [FDA's Good Manufacturing Practices regulations] were mandatory for those who would remanufacture and reuse a 'single-use' device, many (though by no means all) of the risks associated with reuse of single-use devices could be significantly reduced."[20] [emphasis added]

Given these strong objections by manufacturers, it is very unlikely that devices marketed as disposable will in the future be constructed in such a way as to facilitate reprocessing and reuse.

The same cost pressures that produced affordable disposable dialysis devices are continuing to motivate new economies in design of disposables. This was recognized by Dr. Murphy, CDC's investigator in Inglewood, California, as he was learning about the problems associated with dialyzer reprocessing and reuse:

> "More cost effective manufacturing may lead to dialyzers which are less easily disinfected, eg: used to have screw bands on ends of dialyzers so that 'headers' could be exposed; now have ultrasonic welds."[21]

This tendency is significant, particularly in light of the difficulty clinics are already having in disinfecting dialyzers and related devices. Moreover, dialysis devices manufactured for single use only are more likely to fail, due to exceeding tolerances or margins of safety designed in by the manufacturer, during the repeated use and reprocessing they are subjected to in a reusing clinic. For example, FDA found poor manufacturing practices affecting the production of dialysis bloodlines during a December 1985 inspection of a manufacturer:

> "Inspection revealed. . . serious [Good Manufacturing Practices] deficiencies. . . Components designated as critical. . . were not tested. . . Review of bloodline complaints revealed many instances of inadequate follow-up".

In addition, in carrying out their FDA contract the District of Columbia investigators identified reuse of bloodlines from one manufacturer as responsible for 89% of all known bloodline failures in the facilities inspected.

Poor manufacturing of dialysis reprocessing machines and disinfectants.

FDA's Center for Devices and Radiological Health (CDRH) has built an extensive record of poor manufacturing practices by firms that produce automated dialysis device reprocessors and disinfectants used in reprocessing. Clearly, the quality of reprocessing performed on a used dialyzer or bloodline is dependent to a large extent upon the quality of the machine or disinfectant involved in the reprocessing, in much the same way as it depends upon the skill and knowledge of the reprocessing technician.

A chronological summary of FDA's inspection findings relating to poor manufacturing practices associated with construction, labeling and post-marketing surveillance of dialysis device reprocessing machines follows:

- o 7/23/85 FDA Establishment Inspection of a manufacturer of computerized dialyzer reprocessors. "Notice of Adverse Findings. . . Inspection. . . revealed a substantial lack of compliance with the regulations for 'Good Manufacturing Practice for Medical Devices'." A few of the more significant observations included: inadequate or incomplete device inspections, insufficient documentation describing changes in device software, inadequate component control and release, and inadequate or missing written procedures covering various aspects of the manufacturing process.

- o 9/25/85 FDA Establishment Inspection of a manufacturer of an automated dialyzer/bloodline reprocessing machine. A subsequent "Regulatory Letter Recommendation" summarized the findings of the inspection: "This firm's primary product is a device to clean and sanitize kidney dialysis machines so the user can avoid the expense of replacing filters and tubing sets. The. . . inspection revealed deviations from current Good Manufacturing Practices in almost every aspect of their activities. No audits have been conducted.

> Complaints and field failures were not properly investigated. . . Calibration of test equipment was inadequate. . . there is a reasonable possibility, without improvement, of production of defective devices."

- o 12/13/85 MDR received by FDA from an Ohio dialysis clinic regarding "potential injury" event associated with reprocessing disinfectant. "Dialysis center reports the dialyzer manufacturer suspects the disinfectant. . . and is sending out a field investigator. [Dialyzer] design was recently changed without changing the membrane. Manufacturer of [disinfectant] has heard of other problems with this kidney."
- o 5/21/86 FDA Establishment Inspection of manufacturer of disinfectant used for reprocessing of dialysis devices. The inspection revealed ". . . GMP deficiencies including lack of documentation of investigation of a complaint and failure to report an MDR for that incident concerning patients that were hospitalized after their dialyzers were reprocessed with [disinfectant]. . . 'Directions for Use' for this product were found to be inadequate. . . The dialyzers in question had been discarded prior to the investigation. . . The lot number of the product [disinfectant] could not be determined due to poor record keeping". On June 10, 1986 the Boston Regional Office of the FDA recommended a recall of this disinfectant product.
- o 6/27/86 FDA Establishment Inspection at a manufacturer of disinfectant used to reprocess dialysis devices. The inspection was prompted by serious deficiencies in reprocessing procedures at the dialysis centers in Brunswick and Jesop, GA, problems with quality control in the manufacture of the product, and the failure of the manufacturer to file Medical Device Reports (MDRs) with FDA concerning complaints from a hospital in Connecticut and a dialysis center in Fort Worth, Texas.

These establishment inspection reports and medical device report were not provided by FDA to the authors of the assessment until August 11, five days after the assessment was completed and sent to the Assistant Secretary for Health.[22]

Hazards Associated with Improper Water Treatment.

Water is the major component of disinfectant and dialysate solutions used by clinics. The potential harm that could result from impure or bacteria-laden water was recognized by FDA in an October 23, 1984 memorandum to senior staff of the Center for Devices and Radiological Health of FDA, from the Chairman of the "Dialysis Use Committee". The memo conveyed the findings and final report of the Committee, saying

> "The Committee believes that installation of proper water treatment systems (using the Association for the Advancement of Medical Instrumentation [AAMI] standard as a guide) is of utmost importance to protect the health of dialysis patients."[23]

The report of the Dialysis Use Committee was never released to anyone outside of CDRH prior to its being obtained by the Senate Aging Committee in August 1986. Unfortunately, the authors of the PHS Assessment are among those who did not receive the benefit of this report.

In May 1986, the District of Columbia reported the results of their FDA-funded investigation of fifteen local dialysis clinics in a two volume report. Although the report is not primarily focused on reprocessing and reuse of disposable dialysis devices, it identifies many problems with reprocessing practice and procedure. Water treatment systems at the centers were commonly found to be inadequate:

> "Sophistication and efficacy of water purification systems [in the clinics] are diverse. Several systems installed in the facilities

> fall short of compliance with [Association for the Advancement of Medical Instrumentation] water quality standards for dialysis".[24]

Reflecting similar findings as the District of Columbia investigators, the authors of the FDA-funded California Dialysis Facility study noted major problems with water quality and treatment intended to remove impurities and bacteria from the facilities' water supply:

> "Conformance with [water treatment equipment] label requirements was found to be minimal. . . [including] failure to. . . ensure that [water treatment] units regenerated off-site are free of industrial contaminants are disinfected prior to being placed in service. . . Five of the twelve water system problems were due to water system 'dead spots' resulting in the inability to adequately disinfect the system or rinse formaldehyde from the system after disinfection. . . Problems of the nature reported for water systems can be prevented. . . the ability to disinfect and clear the system of disinfectant residual are major system considerations; yet, problems in these areas frequently occur."[25]

The California report details many water system problems that might be a mere nuisance at the average light industrial workplace, but which the report notes could be catastrophic in a dialysis clinic. To correct serious defects in practice, as well as clinic operators' evident underestimation of the significance of proper water treatment, the California investigators suggested imposing the GMPs on ESRD clinic water systems:

> "Water system vendors such as Continental, Culligan, and Arrowhead Industrial Water were responsible for installing the majority of water treatment equipment in the subject dialysis facilities, yet do not appear to be regulated as medical device manufacturers subject to Good Manufacturing Practice controls and medical device labeling requirements. Water for dialysis. . . can profoundly impact the quality of care. It seems reasonable that equipment used to produce water for dialysis be required to meet the same standards of quality and design as the other devices used in the delivery of hemodialysis treatment."[26]

Large numbers of patients are unnecessarily exposed to the risks of reuse, in the name of preventing "First Use Syndrome", while their preventable dialyzer hypersensitivities go untreated.

At the March 6 hearing of the Committee, Dr. Marshall suggested that reuse of dialyzers has been found to be beneficial to patients, compared to single use of dialyzers:

> "The reuse of disposable hemodialysis devices was first proposed by Shaldon in 1963 and reported by Scribner in 1967. Shaldon performed daily dialysis in Britain but was only allowed 3 filters a week by the hospital. This necessitated reuse of the dialyzer. At that time he noted that it was feasible, safe, and associated with fewer complications than was the first use of a new dialyzer. David Ogden later reported the "phenomenon of reaction to new dialyzers," which he associated with the development of respiratory distress, wheezing, malaise, back or chest pain, fever and chills at the beginning of treatment. With recent improvements in dialyzer technology, this syndrome is much milder and associated with weakness, dizziness, and malaise. Aside from virtually eliminating the effects of first use syndrome, reuse has been associated with lower cost."[27]

The assessment report produced subsequently under Dr. Marshall's supervision cites a body of research which identifies one critical qualification of this view. As the report notes,

> "[dialyzer] biocompatibility. . . is dependent on the material used in the manufacture of the [dialyzer] membrane.[28] Different membranes show differences in their ability [to trigger hypersensitivity reactions]. Of the cellulosic membranes, cuprophane is the most reactive and cellulose acetate is the least. Ivanovich and associates have recently reported significant reductions in dialysis related symptoms and in complement activation with the use of cellulose acetate membranes as compared to Cuprophan following a prospective blinded crossover study.[29] Henderson reported that polyacrylonitrite shows no leukopenia and virtually no complement activation.[30] According to Walker both cellulose acetate and polyacrylonitrite appear to be relatively free from the problem of dialyzer (Cuprophane) hypersensitivity which is characterized by acute chest and back pain, dyspnea and diaphoresis with hypotension.[31] Hakim suggested that patients with the first-use syndrome may benefit from dialysis with other types of membranes that cause less complement activation, such as polyacrylonitrile or polymethylemethacrylate,"[32] [emphasis added].

The finding that "patients with the first-use syndrome may benefit from dialysis with other types of membranes" suggests that the term "first-use syndrome" may be a misnomer for a series of reactions better identified as "dialyzer incompatibility". It would appear from this research that many cases of the alleged "syndrome" are in reality due to the incompatibility of certain types of dialyzer membranes with some patients' tissues -- a problem which can be solved by using a different type of dialyzer for those patients.

In 1985 FDA published a study on the subject of patients' hypersensitivity reactions during hemodialysis. The final article was written by two employees of FDA's Center for Devices and Radiological Health (CDRH) but, for unknown reasons, is cited in neither the PHS testimony of March 6, nor the PHS assessment. The CDRH study originated in a 1981 agreement between FDA and seven dialyzer manufacturers, according to the terms of which the manufacturers passed on to CDRH all reports of patient hypersensitivity reactions voluntarily submitted to them by dialysis clinics during 1982 and 1983. The study found that certain groups of patients and certain dialyzers were more likely to be incompatible, resulting in adverse patient reactions:

> "The younger age groups have the highest [adverse patient] reactivity, with nonwhites having a significantly higher reactivity than their white counterparts in any age group. . . An analysis of the reaction rates (the number of reactions reported normalized by the number of dialyzers sold) showed some differences among manufacturers. Dialyzers manufactured with cellulose acetate membranes were associated with the lowest rate of reactions, a rate similar to that associated with Cuprophan membranes. As evidenced by the data and discussion above, a low reported [adverse patient] reaction rate may not depend directly on the dialyzer itself, but is significantly affected by the patient population mix that uses a particular brand of dialyzer."[33]

Dialysis clinic personnel and managers may have failed to appreciate the implications of these findings, if, indeed, they have been made aware of them at all. It would seem reasonable, for example, that a patient who suffers a hypersensitivity reaction after using a new dialyzer should be offered alternative types of dialyzers in an effort to resolve the problem. Yet, the CDRH paper notes that "[a]bout one-fourth of the patients who reacted [adversely to a dialyzer] had previous reactions with the same brand of dialyzer". In this context, the CDRH study suggests

> ". . .the practice of dialyzing patients with the same brand or model of dialyzer after a severe reaction should be carefully examined by dialysis centers."[34]

Overreporting of "First-Use Syndrome".

Moreover, additional evidence suggests that the reported incidence of "first-use syndrome" may be affected by the source of the report. Dialysis clinics may have an incentive to under-report or misclassify under the general label of "first-use syndrome" adverse patient reaction resulting from improper practice and procedure at the clinic.

For example, the CDRH study[35] demonstrated that in over 60% of the reported cases of "first use syndrome" it studied over a two year period, the dialysis facility had failed to follow manufacturer's instructions for preparing the dialyzer prior to patient use. This poor procedure exposes the patient to toxins, such as residual traces of sterilants left over from the manufacturing process, which are supposed to be flushed out prior to use of a new dialyzer. If the dialyzers were properly prepared for use, many of the reactions now being attributed to the "first use" of the dialyzer would not occur during the patient's first use of a new dialyzer.

The 1986 California Health Services Department study,[36] performed under FDA contract, also identified a tendency for clinic operators to simply label any adverse patient reactions as incidents of "new dialyzer syndrome":

> "One [patient's] sensitivity reaction was classified as being patient related although the facility was unable to determine the source of the problem. . . Care should be taken when attributing problems to new dialyzers that other possible contributing factors have been investigated and ruled out."[37]

The California study also corroborates the view that "various steps. . . can be taken to mitigate the problem" referred to as "first-use syndrome" without resorting to reuse, including:

> "The severity and frequency of patient sensitivity to new dialyzers was frequently reduced by switching the patient to a dialyzer with a different membrane material, increasing the volume of the pre-dialysis saline rinse, subjecting the new dialyzer to the reprocessing steps used in a reuse protocol, or pre-soaking the dialyzer with formaldehyde and then rinsing before use. . ."

In view of the dangers associated with formaldehyde exposure, patients will most likely prefer that clinics resolve the problem of dialyzer incompatibility without exposing them to residual formaldehyde -- if they are given a choice.

Further evidence that the type of membrane in the dialyzer is a critical factor in hypersensitivity reactions emerged at the March 6 hearing of the Special Committee on Aging, when Chairman Heinz engaged in the following exchange with Dr. Charles J. Wolf, Chief of the Renal Diseases Section of Pennsylvania Hospital in Philadelphia:

> Chairman Heinz: "Dr. Wolf, I think you mentioned one related issue here which has been cited as a reason to reuse dialyzers, and that is first-use syndrome. Let me ask you, to what extent is this phenomenon of first-use syndrome common or rare in your experience?"
>
> Dr. Wolf: "In my experience, it is very rare. I think if you take a review of the literature it is probably fair to say maybe 3 percent, 5 percent of patients might experience this to a greater or lesser extent. I don't see it that often and I think the reason for that is that we have gotten more and more biocompatible membranes as time goes on. I think some of the studies that showed first-use syndrome previously were with other membranes that have now been discontinued."[38]

PHS' database of adverse effects associated with reuse is incomplete and little-known within the Department of Health and Human Services.

The evidence used for this chapter was obtained from existing PHS files; however, this listing is not a complete accounting of the full extent of mishaps, injuries and deaths in dialysis centers. This is true because the PHS has taken a wholly passive approach to determining what harmful effects dialysis patients may suffer from reusing disposable devices. The Department has failed to organize a systematic and comprehensive data-gathering effort on current practice and its effects on patient health and safety. As a result, what is known is only what has been accidentally discovered or voluntarily reported by parties with little incentive to draw attention to evidence of problems. Also, an unknown number of cases are missing because not all cases reported are investigated.

CDC, for example, does not investigate an outbreak of infections unless they are specifically invited to do so by the clinic, the local health department, and the State health department. CDC elected not to conduct onsite investigations at the Napa, California or Daytona Beach, Florida dialysis centers.[39] Asked if he thought other outbreaks may have occurred that CDC is unaware of, Dr. Murphy replied,

> "I suspect that there might be other outbreaks and that they're not reported to us."[40]

CDC's lack of authority to inspect and investigate has forced them to rely upon the voluntary cooperation of clinics where outbreaks occur. During the series of outbreaks occurring in 1986, this meant delays in CDC's being notified of outbreaks, with one result being the loss of critical evidence essential to their fact-finding role -- ultimately depriving policy makers of necessary information on the subject of reuse. For example, in describing the scene at a Georgia dialysis clinic where a bacteremia outbreak hospitalized several patients after disinfectant was diluted to an ineffective strength, CDC's investigator noted

> "[d]ue to the fact that use of [disinfectant] had been discontinued prior to CDC participation in this investigation, and that the apparatus which had been used for processing dialyzers. . . had been disassembled, we were unable to verify whether or not this additional dilution had actually taken place."[41]

In addition, CDC didn't report some of its most significant findings to the dialysis clinic provider community or to the public at large. For example, when asked if CDC found the number of uses of a disposable dialyzer is positively correlated with increased frequency of infection, Dr. Murphy responded, "I think we showed that clearly in our investigations."[42] Yet, this key finding of the CDC inquiry into the Dallas, Texas and Inglewood, California outbreaks never appeared in the issue of CDC's Morbidity and Mortality Weekly Report (MMWR) which was ostensibly devoted to describing the findings of those investigations.[43]

Evidence of Health Hazards Was Omitted From PHS Assessment.

Unfortunately, most of the evidence of adverse patient outcomes summarized above was not made available to the authors of the assessment report prepared by the National Center for Health Services Research and Health Care Technology Assessment (NCHSR/HCTA) until August 2 and 11, 1986. Because of the rush to complete the NCHSR assessment, this evidence was only superficially dealt with, or was not incorporated in the assessment report at all.[44] For further information on this topic, please see chapter VII of this report, regarding the assessment.

Summary of Findings.

Evidence of adverse health effects associated with reuse was obtained from PHS files. These records reveal that the safety and efficacy of reprocessing and reuse of these devices depends upon the interaction of several factors. These include the quality of manufacturing, packaging, labeling, delivery and storage of (1) the disposable devices themselves, (2) the disinfectant, and (3) the equipment and machinery (both manual and automatic) used for reprocessing the disposable devices. Equally important are the quality of the water piped into the clinic (which is frequently out of the control of the clinic), the procedures used by the clinic, and the degree to which clinic employees are trained and supervised to ensure these that procedures are adhered to in practice.

In sum, this evidence indicates breakdown in every aspect of dialysis clinic reprocessing practice and procedure, from poor quality of equipment, disinfectant, and water used by clinics in reprocessing, to improper removal of residual disinfectant from reprocessed dialyzer devices.

SECTION II:

UNIFORM ENFORCEABLE FEDERAL STANDARDS AS WELL AS ADEQUATE VOLUNTARY GUIDELINES TO PROMOTE SAFETY AND EFFICACY IN REUSE ARE LACKING

Injuries suffered by dialysis patients from increased blood infections, unskilled technicians, inadequate water treatment systems, and poor practices and procedures in reprocessing of dialysis devices, as discussed in the previous chapter, emphasize the need for uniform enforceable federal standards to ensure safety and efficacy in the reuse and reprocessing of dialysis devices. Immediate imposition of the FDA's Good Manufacturing Practices (GMPs), that require reporting of accidents and injuries in clinics, as well as periodic inspections, would protect dialysis patients until standards are promulgated.

Nevertheless, the policy of the FDA, the federal agency with authority to regulate reprocessing, is to avoid promulgating such standards. Moreover, the FDA, primarily for budget reasons, has refused to subject dialysis facilities to GMP requirements, and periodic inspections. Instead, the agency endorsed the development of voluntary guidelines, written by non-governmental groups. Existing guidelines, however, are unenforceable, and are deficient because they only attempt to address the reuse of the dialyzer filter, and not other disposable dialysis devices, including blood tubing, dialyzer caps, and transducer filters.

FDA has repeatedly refused to promulgate standards for medical devices.

It has been long-standing FDA policy to refuse to promulgate standards for dialysis devices, and for all other "class II" medical devices, even though it has had the authority to develop such standards since 1976.[1] This, despite the conclusion of a 1980 study, performed for the FDA to assess the risks and hazards associated with reuse,[2] that said the "practice of reuse is largely unregulated and therefore does constitute a potential threat to patient safety."[3]

To remedy this, the study attempted "to provide [FDA] with the information required for writing and implementing standards." It concluded, however, that:

> "In the absence of definitive studies, such as the one contemplated by NIH, the necessary criteria to establish standards cannot be formulated."[4]

The definitive clinical studies called for in the 1980 report, however, were dropped by NIH and have never been done.[5] Moreover, by May 1981 the NIH had adopted the position that federal standards were unnecessary. Rather, voluntary guidelines established by a non-governmental group should govern the reuse process. An NIH memorandum stated:

> "It would be advisable that suggested guidelines be developed by a non-governmental 'neutral' group. . . The acceptance of the nephrology community would be obtained more readily if this route were followed. We cannot emphasize too strongly the importance of the government not dictating a mode of practice."[6]

This later became the accepted view within the Department of Health and Human Services, and the FDA eventually decided to develop voluntary guidelines for reuse, in lieu of standards.[7] After a ten-month investigation of the reuse issue, Committee Staff noted in its March 6, 1986 report that:

> "Further analysis of FDA, NIH and HCFA documents indicate that by 1983, FDA had apparently had given up on promulgating standards and shifted to a discussion of developing guidelines for reuse and reprocessing."[8]

A July 6, 1983 memorandum from an FDA official substantiates the Committee findings. It stated:

> "We should proceed to investigate the need for and possibly develop guidelines on reuse procedures. . . [that] will provide assurance to patients and organized groups that the government has studied the matter and has endorsed certain principles and/or procedures as adequate."[9]

Later in that same year, the FDA transferred responsibility for the promulgation of guidelines to the Association for Advancement of Medical Instrumentation (AAMI), a private sector organization.[10] In December of 1983 the AAMI Reuse Committee had its first meeting, and initiated work on a national consensus guideline for reuse of dialyzers.[11] Although representatives from the FDA and the CDC are voting members of the AAMI Reuse Committee, the guidelines point out that "participation by federal agency representatives. . . does not constitute endorsement by the federal government or any of its agencies." [12]

Thus, the FDA has absolved itself of any responsibility for developing either standards or guidelines, and as a result, procedures used for reuse and reprocessing of dialysis devices are unregulated. Consequently, there is a wide variety of reprocessing procedures, creating an even greater health risk for dialysis patients.[13] Further, because there are no standards, there are no regular inspections to ensure that clinics use proper reprocessing procedures, and there is no requirement that facilities report injuries and accidents that occur during treatment of patients.

Immediate imposition of the Good Manufacturing Practices would provide protection to dialysis patients until standards are in place.

The FDA has been charged with maintaining the safety and efficacy of medical devices under the Federal Food, Drug, and Cosmetic Act (the Act).[14] In 1978, pursuant to the Act, the FDA promulgated the Good Manufacturing Practice regulations (GMPs).[15] The GMPs were enacted to ensure that the methods used in, and the facilities and controls used for, the manufacture, packing, storage, and installation of medical devices conform to regulatory requirements, thereby assuring that devices are safe, effective and otherwise in compliance with the Act.[16] The regulations have been codified at 21 C.F.R. 820 et seq. (1985).

Although there is no definition of "reprocessor" in the regulations, the GMPs define a "manufacturer" in the following manner:

> "'Manufacturer' means any person, including any repacker and/or relabeler, who manufactures, fabricates, assembles, or processes a finished device. The term does not include any person who only distributes a finished device."[17]

The GMPs impose a series of requirements on "manufacturers". For example, they require periodic inspections of facilities to ensure they are using safe procedures.[18] In addition, clinics subject to the GMPs must employ sufficiently educated and properly trained personnel.[19] Moreover, under the regulations, facilities must report injuries that occur as a result of reprocessing.[20]

The FDA, however, has never subjected reprocessors of dialysis devices to these regulations. Instead, the FDA's position has been that reprocessing and reuse is a matter of "medical practice" and therefore cannot be interfered with.[21]

This position was expressed at the Aging Committee hearing by John Villforth, Director for the Center for Devices and Radiological Health of the Food and Drug Administration. He said:

> "[The] washing of devices does not have anything to do with the manufacturing of devices. It is not the responsibility of the Food and Drug Administration how the physician cleans the tools that he or she uses."[22]

Mr. Villforth explained at the hearing that the GMPs are procedures developed and designed for manufacturers to help them produce quality products, and are not applicable to the reuse of dialysis devices.[23]

> "We have not in the past considered [reprocessing] to be manufacturing or remanufacturing under the intent of the medical device amendments."[24]

The FDA continues to voice strong opposition to the application of the GMPs to the reuse and reprocessing of dialysis devices. As Mr. Villforth said during his deposition:

> "I am opposed to, I can't recall all of the reasons that may have been stated before, to doing good manufacturing practices because it is dumb."[25]

Mr. Villforth said the GMPs as written were intended to help eliminate product recalls by imposing upon manufacturers a degree of sensitivity for the quality of their work, documentation and attention to detail. The current regulations would be inapplicable in a clinical environment for reuse.[26]

Another explanation for FDA's refusal to apply the GMPs to dialysis clinics is the lack of financial resources. According to Mr. Benson, imposition of the GMPs on dialysis clinics would cost approximately $700,000 each year.[27] He explained that inspecting the clinics regularly, as the GMPs require, would be a tremendous drain on FDA's already shrinking budget. During his deposition, Mr. Benson also claimed that FDA inspections would be inefficient, since the vehicle for this type of inspection already exists under HCFA's existing regulatory authority.[28]

FDA's interpretation of the GMPs is inconsistent with the language of the regulations, as well as existing law.

FDA's interpretation of the GMPs, as explained by Mr. Villforth, is inconsistent with the express language of the regulations. The language of the GMPs is already applicable to the reuse and reprocessing of dialysis devices. Giving the words their ordinary meaning in common usage, the definition of "manufacturer" governs the operations of dialysis facilities that reuse dialysis equipment.[29] The safety requirements of the regulations, therefore, are applicable to dialysis facilities.

Moreover, information obtained by Committee investigators illustrates that the position enunciated by Mr. Villforth is not completely accepted within the FDA itself.

In a letter to HHS Secretary Bowen, Assistant Secretary for Health Donald MacDonald attached a briefing paper containing an opinion from the General Counsel. The paper said "a legal argument can be made for imposing [the GMPs] or not enforcing them on dialysis clinics. It therefore becomes a policy decision."[30] At their depositions, both Mr. Villforth and James Benson, Deputy Director of the Center for Radiological Health admitted that FDA policy, rather than a legal interpretation of the regulations, provides the justification for the decision to not impose the GMPs on dialysis clinics.[31] Moreover, evidence obtained by Committee staff indicates that pacifying Senator Heinz, and preventing further inquiry was the basis for this policy.[32]

Further, the Reuse Committee, an internal task force within FDA, has adopted the view that the GMPs apply to reuse. In its report of February 24, 1986 entitled "Working Paper: Policy Considerations for the Reprocessing of Devices", the Committee said that:

> "all reprocessors should be required to comply with Good Manufacturing Practice (GMP) regulations to assure that the reprocessed device continues to be safe and effective for its intended use."[33]

The report concluded that reuse and reprocessing of dialysis equipment falls within the regulations:

> ". . . routine reprocessing of hemodialyzers should be construed within the activity performed by a manufacturer."[34]

On May 16, 1986 the Reuse Committee presented an Options Paper to Senior Staff. This paper explains that "[a]lthough FDA believes that the decision to reuse may be a medical decision, the reprocessing is not."[35]

In July of 1986, the Reuse Committee published an Option Paper discussing FDA policy options regarding reuse. This report noted that facilities that reprocess for non-medical reasons (i.e. economic and financial reasons)[36] could be considered "manufacturers" under the regulations.

> "It could reasonably be interpreted that these physicians or facilities are acting more like manufacturers and less like physicians and therefore should not be exempt from those sections of the Act pertaining to physicians (and by inference to clinical facilities).[37]

Additionally, there are several reasons why reprocessing of disposable dialysis equipment is not "medical practice". While the label "medical practice" implies highly skilled medical professionals providing care, physicians do not themselves perform, or supervise performance of reprocessing dialysis devices. Further, reprocessing is performed in health facilities, under the supervision of health facility employees, and not in doctor's offices. This is critical because current law distinguishes between physician practice and health facility practice.[38] Moreover, in every other aspect of their functioning, ESRD clinics are recognized under the law and regulated as health facilities and enjoy no special status as "medical practitioners".[39] This was admitted by the FDA Reuse Committee, which stated in its February 1986 Working Paper that the exemption from FDA inspections that is afforded to "practitioners licensed by law to prescribe or use devices" does not apply to reprocessing of disposable dialysis devices by ESRD facilities. The report said:

"The Reuse Committee believes that large scale routine processing of devices for reuse performed at health care facilities do not fall within this exempted category."[40]

Existing voluntary guidelines do not provide adequate protection to dialysis patients.

In lieu of uniform federal standards, the FDA has proposed the adoption of voluntary guidelines to govern reuse and reprocessing of dialysis devices. Patients, however, are unprotected by current voluntary guidelines because they are seriously deficient. While existing guidelines attempt to address the reuse of the dialyzer, most fail to specify procedures for the reuse of other dialysis devices. For example, the AAMI guidelines are silent on the reuse and reprocessing of blood lines and tubing, transducer filters, and dialyzer caps.[41] Guidelines published by the National Kidney Foundation do not address water quality. The PHS assessment concluded that adoption of these guidelines will "not necessarily resolve such reuse issues."[42]

An additional problem with current guidelines is that no agency has the regulatory authority to assure compliance with them. The FDA Reuse Committee said "[i]f serious problems arise. . . there is no clear regulatory authority to prevent the facility from continuing its activities. . ."[43]

Adding to the confusion in reprocessing procedures, many clinics have adopted their own protocols. According to the draft final report entitled "California Dialysis Facility Study", performed for the FDA, the clinics often don't follow their own procedures. This report stated:

> "Facilities are frequently not adhering to their protocols, and the general lack of quality control and assurance procedures indicates that at least some of the reuse programs are not operating in a state of control."[44]

During his deposition, Dr. John Murphy, an investigator with the Center for Disease Control, (CDC), said it would be inaccurate to say that virtually all facilities are following adequate procedures.[45] Further, when an infection occurred at a dialysis clinic in Florida, it was discovered that the facility had no written document explaining reuse procedure. Instead, the facility relied on verbal instructions and the memory of the reprocessing technician.[46]

Conclusions and Recommendations.

While physicians, industry, and government agencies have recognized the need for standards to improve the treatment provided to dialysis patients, there still are no standards that are uniform, complete, and enforceable. Further, existing voluntary guidelines provide inadequate protection to dialysis patients. Application of the GMPs would solve these problems, by ensuring that dialysis clinics perform reprocessing properly, and by providing the FDA with the regulatory authority to enforce these standards.

FDA officials have informed Committee staff that imposition of the GMPs would be costly and ineffective. These officials have stated, however, that new regulations could be drafted that contain the philosophy of the GMPs, but are specifically designed for reuse and reprocessing.[47] In addition, the May 16, 1986 Reuse Options Paper notes that FDA regulation of reprocessing could lead to better care for dialysis patients:

> "The fact that FDA regulates reprocessing for reuse could result in significant improvement in the reprocessing of all devices."[48]

The report also states:

> "Without oversight, FDA cannot be confident that reprocessors are conforming with reasonable protocols and that reprocessed devices are as safe and effective as the original."[49]

Based on this Committee's investigation, it is clear that standards are needed to reduce the risk faced by thousands of dialysis patients who are subjected to reuse. According to the task force within the FDA, as well as the plain meaning of the GMPs, dialysis facilities already fall under the regulations. In the alternative, amending the GMPs or developing new regulations specifically for reuse based on the GMPs, would help alleviate the risk of sickness, injury and death faced by dialysis patients.

SECTION III:

FDA AND HCFA HAVE SHIRKED THEIR RESPONSIBILITY TO ENSURE SAFETY, EFFICACY, AND QUALITY OF CARE IN DIALYSIS

The federal regulatory agencies, FDA and HCFA, have failed their congressionally-mandated responsibility to protect patients subjected to reuse. The FDA has weakened its compliance policy on reuse, and has yet to promulgate enforceable standards or apply existing regulations to the reuse process. In addition, contrary to assurances made to this Committee, HCFA has failed to adequately enforce the Medicare conditions of participation. Consequently, many dialysis patients have been forced to reuse under threat of discharge from their clinics. Moreover, HCFA has previously attempted to reduce dialysis reimbursement rates. This action would undoubtedly create a financial strain on dialysis facilities, and encourage, if not force, clinics to reuse.

The FDA has substantially weakened its compliance policy in regulating reuse of disposable devices. Prior to July 1981, FDA compliance policy regarding reuse of disposable medical devices was as follows:

> ". . . There is a lack of data to support the general reuse of disposable devices. . . [T]he institution or practitioner who reuses. . . should be able to demonstrate: (1) that the device can be adequately cleaned and sterilized, (2) that the quality of the device will not be adversely affected, and (3) that the device remains safe and effective for its intended use. . . FDA considers disposable devices which are being reused, and which have not been demonstrated to be capable of complying with the requirements in the above [sentence], to be adulterated. . . and in violation of [the Federal Food, Drug and Cosmetic Act]."[1]

On July 1, 1981, however, FDA published a new compliance policy guide which deleted the possible finding of "adulteration" prosecutable under the Act. That language was replaced with the following:

> ". . . The reuse of disposable devices represents a practice which could affect both the safety and effectiveness of the device. Information developed regarding this practice should be referred to the [FDA's] Bureau of Medical Devices for review and evaluation."[2]

Since 1981, the FDA has conducted only a handful of field inspections relating to reuse of disposable dialysis devices.[3] A review of FDA documents reveals that the agency believed it was not responsible for inspecting dialysis facilities.[4]

Recently, however, as more evidence of the dangers of reuse surfaced, the FDA has re-examined whether it should inspect dialysis clinics. Some FDA officials argued that inspections would ensure that clinics use proper reprocessing procedures.[5] The FDA Reuse Committee stated:

> "Without specified inspections of the noncommercial reprocessors, FDA still would be relying on the courts and thus on patient injury before it would act."[6]

Other FDA officials, however, argue that regulation of dialysis clinics is not feasible. During his deposition, Mr. Benson said that a major explanation for the FDA's policy of not enforcing the GMPs on dialysis clinics is budgetary considerations.[7] He added, however, that FDA regulation would also be improper because HCFA already has the authority to inspect dialysis clinics to ensure they follow adequate procedures.[8]

While the FDA has transferred oversight and regulatory responsibility to HCFA, that agency also faces difficult budget decisions. In a June 5, 1985 memorandum, Philip Nathanson, then Director of the Health Standards and Quality Bureau for HCFA, explained the guidelines by which all HCFA Regional Administrators request Federal money for survey and certification activities for fiscal year 1986. This memo states:

> "Survey activities for [fiscal year] 1986 should be scheduled and conducted in accordance with national [budget] priorities."[9]

The memo further states that while sufficient funds have been provided to survey and certify all long-term care facilities, "remaining Medicare funds are to be used for surveying [all] non-long-term care facilities, subject to national priorities and budget limitations."[10]

The consequence of this policy is that HCFA cannot adequately conduct annual inspections of ESRD facilities. In fact, the memo admits that HCFA inspectors are only required to inspect 57% of the ESRD clinics in their region. In contrast, HCFA nationally inspects an average of 66% of all health-care facilities and 100% of all nursing homes.[11]

Federal law, enforced by the States under supervision from HCFA, requires that dialysis clinics receiving Medicare funds respect and observe certain fundamental patients' rights, including the requirements found in the Medicare Conditions of Participation for ESRD providers.

According to these regulations facilities furnishing dialysis care, and seeking Medicare reimbursement, must satisfy certain health and safety requirements.[12] These conditions of participation require that each dialysis clinic adopt written policies regarding the rights and responsibilities of patients.[13] The regulations specify that the policies ensure at least the following:

- o "(a) All patients in the facility (1) are fully informed of these rights and responsibilities. . ."[14]
- o "(b) All patients treated in the facility (1) are afforded the opportunity to participate in the planning of their medical treatment. . .[and] (2) are transferred or discharged only for medical reasons or for the patient's welfare or that of other patients, or for the nonpayment of fees (except as prohibited by [the Medicare program]). . ."[15]
- o "(c) All patients are treated with consideration, respect, and full recognition of their individuality and personal needs. .[16]
- o "(d) All patients are ensured confidential treatment of their personal and medical records. . ."[17]
- o "(e) All patients are encouraged and assisted to understand and exercise their rights. Grievances and recommended changes in policies and services may be addressed to facility staff, administration. . . and agencies and regulatory bodies with jurisdiction over the facility, through any representative of the patient's choice, without restraint or interference, and without fear of discrimination or reprisal."[18]

Although these regulations are explicit, many facilities refuse to abide by them. As a result, many dialysis patients are deprived the rights guaranteed them by law. For example, the "consent forms" provided by clinics to dialysis patients before they reuse often provide only scant information of the risks of reprocessing dialysis devices. Further, many fail to mention the risks associated with the use of formaldehyde as a sterilant, and do not inform the patient that a blood thinner may be used to maximize the number of times a dialyzer can be reused.[19]

Moreover, most consent forms do not provide the patient with freedom of choice on whether or not to reuse. Committee staff has also discovered cases where patients have been coerced and forced into submitting to reuse by facility staff who tell them that if they refuse to allow reuse, they must seek treatment elsewhere.[20]

The State of California has studied the reuse issue for many years. Reports of violations of patient rights in California mirrors the complaints received by Committee staff. Since clinics have the financial incentive to reuse, patients are being pressured to submit to reuse.[21] The State Health Department explained that if patients are fearful of losing the ability to receive treatment because they do not consent to reuse, they do not truly have full freedom of choice:

> "When a facility's policy requires a patient to either consent to 'reuse' or seek dialysis elsewhere many patients really have no choice but to consent. . . It is not oversimplification to state that patients may be fearful of losing the ability to be dialyzed."[22]

To remedy this problem, California has proposed a regulation that attempts to reconcile patients' rights and facility's economic interests. This regulation requires written informed consent for patients who reuse.[23] The regulation also provides that the consent form state the advantages and disadvantages of reuse. In addition, it guarantees that a patient has the right to treatment with a new dialyzer if he or she does not consent to reuse.[24]

At the March 6, 1986 Aging Committee hearing, a panel of witnesses testified that many dialysis clinics across the country are depriving patients of their rights.

Ms. Melinda McFadden, a dialysis patient from Philadelphia, testified that her clinic gave her an ultimatum: either submit to reuse, or find treatment elsewhere.

> "When I began to question the reuse [of her dialyzer]. . . I was told if I did not like it. . . I had to go someplace else. [The doctor said] I had to leave the unit and look for someplace else to go. . . He told me I could not stay there if I did not want to reuse."[25]

Mr. Vagn Vogter, a former dialysis patient, also stated that when he asked a nurse to limit the reuse of his dialyzer and blood lines, he was "told to go somewhere else for treatment."[26]

Mr. Robert Rosen, chairman of the National Kidney Patients Association said that patients are being "coerced, threatened, intimidated, and finally denied their life-sustaining treatment."[27] He also described the retaliatory practices employed by some clinics when patients object to reuse.

> "One of the patients. . . who questioned the reuse in his unit was forced to have his treatment performed for four hours, three times a week while he was facing the wall."[28]

Malcolm Schuman, whose mother was a dialysis patient, testified that her dialysis clinic sent scare letters to its patients, warning them that if [Reagan] [A]dministration proposals on the reduction of hemodialysis benefits passed [in Congress], they, the patients, could be left without treatment.[29] Dr. Schuman also explained that his mother lived in constant fear of the clinicians. To illustrate, he recalled for the Committee that when he told her about the health dangers related to reuse, she exclaimed "Malcolm, for God's sake, be careful. I'm in the power of these people."[30]

At the hearing, Bartlett S. Fleming, Acting Deputy Administrator for HCFA, stated that HCFA surveyors review all facilities for compliance with federal regulations, and when deficiencies arise, they take appropriate action, including decertification of the clinic, if necessary.[31] He said, however, that the conditions of participation have no requirements for standards regarding informed consent and freedom of choice.[32]

In addition, HCFA maintains that the procedure followed by clinics is a matter of medical practice, and therefore not subject to regulation.[33] Mr. Fleming stated the physician is responsible for knowing each clinic's policy on reuse, as well as the specific reprocessing procedures they use.[34] Further, Mr. Fleming said that if a physician disagrees with a facility's treatment procedures, he should "discuss it" with the clinicians, and "work through the professional associations" in the same manner as other disputes he has had with physicians about prescribed treatments.[35]

In addition, Fleming stated that threatening patients with ultimatums is "intolerable". He said, however, that the responsibility for investigating these allegations and enforcing the conditions of participation rests with the States, through their survey and certification process.[36] He also stated he hoped that citizens

> "are not the least bit shy about contacting the Health Care Financing Administration. . . so that we can follow up and investigate those charges."[37]

During his testimony, Mr. Fleming promised Chairman Heinz, as well as the witnesses, that HCFA would investigate the incidents described.

> "Based on the testimony that we have heard today, we not only will be checking on those specific incidents, but redouble our efforts to communicate with our State contractors to ensure that these [clinics] are being watched."[38]

On June 13, 1986, Mr. Fleming wrote a letter to Chairman Heinz explaining the results of HCFA's investigation.[39] In this letter, he stated that both Ms. McFadden's and Mr. Vogter's case had been resolved. He said that HCFA personnel investigated the complaints of "forced" reuse testified to by Ms. McFadden, and said her clinic was now in compliance with the conditions of participation, and allowing freedom of choice.[40] Mr. Fleming also stated that the HCFA regional office investigated the clinics Mr. Rosen and Dr. Schuman complained about, and found them to be in compliance with Federal standards.

Mr. Fleming concluded the letter by reiterating that HCFA will monitor ESRD clinics to ensure that patient's rights are respected.

> "Though HCFA's policy has always been that the decision to reuse is a medical practice issue, which should be decided by a patient's physician, we do not, and will not, tolerate facilities which 'force' their patients to reuse at the risk of being denied treatment. We will continue to monitor ESRD facilities as part of our survey and certification process and will investigate all patient complaints."[41]

Originally, HCFA policy regarding patient rights was consistent with Mr. Fleming's statements. In June of this year, a dialysis patient in Philadelphia was denied treatment at his facility because of an altercation with facility staff.[42] Instead, he was forced to receive treatment on an emergency basis at local hospitals. A HCFA official who investigated the incident stated:

> "[The patient] has received treatments only when he has been on the brink of being completely overcome by the effects of his disease."[43]

According to HCFA, since the patient had been told by facility staff not to report for further treatment, and was not provided with an appropriate alternative facility, he had not been properly discharged or provided for, in violation of the Medicare Conditions of Participation.—

> "We are deeply concerned that a patient, who has been receiving chronic dialysis treatment on a planned schedule, is thrust into a regimen in which he must be in acute distress before receiving treatment. Such action, having been carried without a medical determination being made. . . is a clear violation of [the regulations]."[44]

As a result of this preliminary investigation, HCFA sent the facility a disciplinary letter, notifying it of the possibility of a formal investigation by the agency. In addition, the letter said that until an orderly transfer can be arranged, the clinic must provide dialysis treatment.[45]

Committee staff has continued its investigation of practices at dialysis clinics, and despite Mr. Fleming's assurances and HCFA's original policy, have been informed of several cases of patients being forced to reuse. For example, a dialysis clinic in Washington, D.C. informed its patients recently that it was beginning to reuse blood tubing. The clinic told the patients that if they did not consent to reuse within 30 days, they had to relocate to another facility.[46] At least four patients protested because they were concerned about the health risks of reuse and because they did not want to transfer.[47]

As a result of this controversy, on August 5, 1986, Claudette Campbell, a HCFA representative in Region III, Philadelphia, asked for a policy clarification of HCFA's position on the reuse of bloodlines. On August 15, 1986, in a sudden and unexplained reversal of the policy enunciated only 60 days previously, Thomas Morford at HCFA headquarters instructed Region III that reuse is a matter of medical practice, and cannot be federally regulated.[48] HCFA's policy reversal in effect endorses forced patient participation in reuse. Yet this facility practice, in the absence of adequate guidelines or standards governing safe reprocessing, amounts to forced participation in an experimental treatment -- in violation of the ESRD Patients' Rights codified in Federal regulations. Thus, notwithstanding Fleming's assurances to Chairman Heinz, HCFA is not enforcing the patients' rights guaranteed in Federal law. In the absence of appropriate regulatory action by the administrative agency charged with the enforcement of pertinent Federal law, patients have been forced to resort to time-consuming and expensive private litigation to secure their rights [please see Appendix IV to this report for an example].

HCFA proposes cutbacks in ESRD reimbursement rates.

In 1986, HCFA attempted, by regulation, to reduce the reimbursement rate paid by Medicare to ESRD facilities.

Prior to publication of this regulation, HCFA determined it should not adjust the Medicare reimbursement rates by the amount of reuse performed by dialysis clinics. This adjustment, which would have paid a lower reimbursement rate to clinics which have lower costs due to their policy of reuse of disposable devices, had been suggested as a way to avoid penalizing clinics which have elected for medical reasons not to reuse, and have higher costs as a result. In rejecting this suggestion, HCFA explained:

> "We do not intend to adjust the individual facilities' rates to their actual costs, because this removes the incentive to be efficient."[49]

The argument that reuse is a desireable economic efficiency was also expressed by DHHS Secretary Bowen. In a recent letter to Chairman Heinz, he stated:

> "[W]e are very mindful of our responsibility to assist in the financing of this essential medical treatment. However, we also have a responsibility to promote the most efficient program that we can."[50]

In addition, the memorandum from the Office of Management and Budget (OMB) authorizing the regulation states that a single reduced rate would "reward those centers that are financially more efficient."[51] Moreover, OMB and HCFA believed that reuse does not pose a health risk to dialysis patients. In reaching its conclusion, OMB relied on a report performed for the NIH entitled "The Multiple Use of Hemodialyzers".[52] This study stated that, under proper conditions, the reuse of dialyzers is a safe procedure.[53] The OMB authorization memo, however, failed to point out that the subcontractor who performed the research was highly critical of the final report, saying the author misinterpreted and misrepresented the data.[54]

Since the decision to reuse is an economic one,[55] the consequence of such a regulation would be to increase the number of clinics that reuse. In fact, during his deposition, Dr. Carter stated that many facilities had already written to the PHS saying that if the reimbursement rates decrease, they will be forced to reuse dialysis devices.[56]

In addition to promoting economic efficiency, HCFA justified the regulation on its belief that reuse was a safe medical procedure. The notice filed with the regulation states:

> "In the absence of a demonstrated need for a particular method of operation to ensure patient safety, medical practitioners should be permitted to devise appropriate methods of treatment."[57]

The basis for this statement was a memorandum written by Dr. Robert Windom, DHHS Assistant Secretary for Health, to Dr. William Roper, Administrator of HCFA.[58] According to the memo:

> "The findings to date indicate that when [appropriate quality of control is exercised], patient outcomes appear to be no different in facilities that reuse dialyzers than for those facilities where single use is the normal operating mode. . . The absence of reported increases in the morbidity and mortality given increased practice of reuse suggests that virtually all facilities are following adequate procedures."[59]

Dr. Windom justified his conclusions on a memorandum he received from Dr. John Marshall, Director of the NCHSR, that purported to summarize the PHS assessment of the effects of reuse.[60] Dr. Marshall wrote:

> "While the current information does not provide evidence that multiple use is without hazard, neither does it demonstrate sufficient grounds to abandon reuse."[61]

This memo, however, did not accurately state the findings and conclusions of the assessment. During his deposition, Martin Erlichman, the principal author of the assessment, disputed Dr. Marshall's conclusions. Mr. Erlichman stated that Dr. Marshall inaccurately summarized the report.[62] Further, Dr. Enrique Carter, who supervised the PHS assessment, agreed that the report was improperly used, referring to Dr. Windom's statement as a "non sequitur".[63] Moreover, he said that HCFA's justification for the regulation contradicted the PHS assessment. He stated:

> "Our assessment report, in the findings and conclusions, say[s] something that is somewhat opposite to [HCFA's position]."[64]

HCFA maintained that the regulation will not diminish the quality of care practiced by dialysis facilities. Rather, HCFA argued, quality of care will be sustained because ESRD clinics will remain subject to periodic surveys to ensure compliance with the conditions of participation.[65] The notice in the Federal Register stated:

> "The conditions of participation for ESRD facilities establish the requirements that we believe are necessary to ensure quality care. . . Facilities are surveyed periodically to ensure that they continue to be in compliance with these requirements."[66]

As mentioned previously, however, HCFA only inspects 57% of all ESRD clinics, and has contradicted its policy statements with inaction on complaints related to forced reuse. HCFA surveys, therefore, cannot be relied upon at present to provide adequate assurance of proper care.

SECTION IV:

PHS FAILED TO GATHER DATA NEEDED TO DETERMINE THE SAFETY AND EFFICACY OF REUSE

The PHS's failure to gather data essential to determining the safety and efficacy in reuse of disposable dialysis devices stems primarily from a decision in early 1981[1] to discontinue a study mandated by the Congress.

A 1978 law required the Secretary of DHHS to conduct this study, which was to investigate the medical appropriateness and safety of reprocessing and reuse of dialyzer filters. But, in early 1981, NIH scrapped the most important part of the study -- the clinical trials -- which could have determined the degree and kinds of hazards and dangers associated with reuse. The NIH reasoned that these studies would make "a low contribution to basic medical science."[2] Interest in sponsoring such patient studies resurfaced within PHS and HCFA later in 1981 and again in 1982 within the PHS and HCFA, but no action was taken. At issue was funding for the clinical study.[3]

In October 1983, there was yet another unsuccessful attempt to obtain meaningful and adequate data on reuse. A PHS Coordinating Committee for ESRD decided against clinical study, but recommended to the Assistant Secretary for Health that "HCFA be authorized to implement a comprehensive Departmental ESRD database." This group further recommended that "HCFA should include information on dialyzer reuse in its comprehensive. . . ESRD database. . . and, using this data base, FDA [should] initiate a study to compare the outcome of patients treated with dialyzers used once vs. multiple uses."[4] The FDA study was never initiated for lack of data support from HCFA.

Sometime during 1983, however, the FDA's Center for Devices and Radiological Health (CDRH) established "The Dialysis Use Committee," an ad hoc group charged with identifying problems in dialysis, including reuse of disposable devices. A report issued to the senior staff of CDRH in October 1984 identified "dialyzer reuse" as one of "a number of urgent issues" relating to dialysis. The report contains 39 pages of problems associated with reuse and other practices and conditions in dialysis clinics, including bacterial contamination, inadequate disinfection procedures, toxic materials in water supplies crossing into the bloodstreams of patients, and others.[5] As far as can be determined, this report was not shared with anyone outside of CDRH until August 29, 1986, when it was provided to Aging Committee staff for review.

CDRH did use the "Report of the Dialysis Use Committee" in formulating contracts with three states and the District of Columbia in 1984 for the purpose of conducting surveys in a sampling of dialysis clinics.[6] These surveys were designed to identify problems or potential problems in all areas of dialysis, including reuse, and were completed in mid-1986. Two of the surveys, those conducted in the District of Columbia and California, revealed serious problems with reprocessing and reuse.[7]

Again, in 1985, the issue of obtaining data on reuse surfaced in the PHS and HCFA. Staff met in July of that year "to consider the establishment of a nationwide ESRD patient data system."[8] This data system, however, is still in the planning stages.

Since 1977, when clinics began reprocessing disposables for reuse, the PHS has relied largely upon an annual Centers for Disease Control (CDC) survey of clinics for information concerning adverse effects of reuse on patients. In testimony before the Senate Aging Committee on March 6, 1986, the PHS cited CDC survey results as proof that the rate of infection among dialysis patients does not increase with reuse.[9] Dr. John Marshall, director of NCHSR/HCTA and principal witness for PHS, testified, "[t]o date no difference has been demonstrated."[10]

What the PHS testimony neglected to point out is, that reporting by the dialysis clinics in this annual survey is voluntary, and no assessment had been made of the validity of survey results.[11] The PHS testimony also omitted the fact that the survey does not include any specific questions dealing with increased rates of infection in patients subjected to reuse, and that there are no data covering this hazard on a national basis.[12]

The PHS and HCFA have been aware for at least two years that an increasing number of dialysis clinics are reusing other disposables, blood lines, transducer filters and dialyzer caps, as well as the dialyzer filters. But neither the PHS, HCFA, nor anyone else has attempted to collect data on the safety and efficacy of this practice.[13] Following the Aging Committee's March 6 hearing, CDC also acknowledged that "there are no guidelines or recommendations that extend to these devices."[14]

It was only after the CDC's investigations of patient infection outbreaks in March, April, May and June of this year that CDC epidemiologists recognized a serious need for clinical data on reuse.[15] On July 8, 1986, the CDC's two epidemiologists most involved in the reuse issue, wrote to their superior regarding this problem.

> "It is evident that the data base concerning the safety and appropriateness of reusing disposable [dialyzers] is currently inadequate to make a scientific assessment of whether or not this practice should be promoted, tolerated, or prohibited for public health purposes. Even if the practice is found to be safe (or even beneficial), there is an obvious need for standards addressing the manner in which reuse is performed. Such standards must be based on clinical trials and incorporate long-term assessments of patient outcomes using a variety of measures, including morbidity and mortality."[16]

Lacking comprehensive, statistically valid data, the PHS has heretofore relied on flawed studies and malinterpretations of its own inadequate data on hand to support its claim that reuse is safe and efficacious. A discussion of this issue can be found in the section following.

SECTION V:

PHS RELIED ON FLAWED STUDIES, AND MALINTERPRETED ITS OWN DATA TO ASSERT THAT REUSE IS SAFE AND EFFICACIOUS

Having failed to conduct studies essential to determining the effects of reuse on dialysis patients, PHS used poorly designed and/or incomplete studies, as well as faulty interpretation of its own data to claim that reuse is safe and efficacious. PHS testimony before the Aging Committee on March 6, 1986 concluded, "[w]e consider that ample experience exists today to suggest that no health hazards for dialyzer reuse have been demonstrated."[1]

Testimony of other witnesses,[2] as well as additional information and data gathered by Committee staff following the hearing, have clearly shown the PHS conclusion to be without foundation and, therefore, misleading and deceptive. Nonetheless, PHS continues to rely heavily upon these same flawed data and studies, while largely ignoring the data and information revealing serious hazards and dangers in reuse. Discussed below are several examples of flawed data and arguments used by PHS to support its claim that reuse of disposable dialysis devices is safe and efficacious.

Example No. 1. The principal witness for PHS at the March 6 hearing, John Marshall, Ph.D., Director of NCHSR/HCTA, PHS, cited the NIH-sponsored report, "Multiple Use Of Hemodialyzers," to support his contention that there are "no hazards associated with [reuse] if done properly."[3] The report "Multiple Use Of Hemodialyzers", most often cited to support the safety and efficacy of reuse, was prematurely terminated by NIH in 1981, and contained no study of the effects of reuse on dialysis patients.

Despite its failure to complete this study, NIH permitted the National Nephrology Foundation (NNF), its primary contractor for the study, to issue a report, "Multiple Use Of Hemodialyzers," in June 1981. The NNF report relied heavily on a limited study of the effects of reprocessing on disposable dialyzers. This "In-Vitro Evaluation Of Certain Issues Related To The Multiple Use Of Hemodialyzers"[4] was conducted by Arthur D Little, Inc. (ADL), as a subcontractor to NNF.

Committee staff investigation revealed, however, that NNF had not given ADL an opportunity to review the "Multiple Use Of Hemodialyzers" report prior to publication; and that, in October 1981, ADL had complained to NNF for alleged misrepresentation and malinterpretation of the ADL research findings.[5]

Dr. Marshall testified under oath on September 11, 1986 that, prior to his testimony on March 6, he had been aware of the "controversy" and allegations concerning the NNF final report, but that he had "discounted" them.[6]

Enrique D. Carter, M.D., Dr. Marshall's subordinate and the person directly responsible for the PHS assessment of reuse which was conducted following the March 6 hearing, gave sworn testimony[7] on September 12, 1986 concerning the NNF's report, "Multiple Use Of Hemodialyzers". Dr. Carter stated that, prior to an April 17, 1986 meeting with Aging Committee staff, he was not aware that the NNF report "was lacking in substantive factual data to support some very important conclusions."[8]

Dr. Carter further testified that Norman Deane, M.D., principal author of the NNF report, was unable to refute the complaints and charges of ADL when questioned by NCHSR/HCTA staff in June of this year.[9]

On August 6, two months after the meeting with Dr. Deane, Dr. Marshall submitted the NCHSR/HCTA report on the assessment of reuse to the Assistant Secretary for Health. Inexplicably, this report cited the "data" in the NNF report as having "persuaded" nephrologists "that reprocessed [dialyzers] maintain states of cleanliness, function and sterility. . . which is equivalent to the first-use dialyzer."[10] No reference whatsoever was made about the controversy surrounding the NNF report, nor to the fact that Dr. Deane could not refute the charges leveled by ADL.[11] When asked why the assessment report had cited the NNF report without at least having stated that it was controversial, Dr. Carter testified that it would have been "more appropriate" for the assessment report to "have probably included a critique of all the data we cite[d]."[12]

Example No. 2. Dr. Marshall cited in his testimony on March 6 a "recent study" by Victor E. Pollak, et al., "Repeated Use of Dialyzers Is Safe: Long-Term Observations on Morbidity and Mortality in Patients With End-Stage Renal Disease."[13] Dr. Marshall asserted that this study "showed no difference in morbidity, mortality or days of hospitalization between single and multiuse patients."[14]

James R. Beall, Ph.D., a board-certified toxicologist, reviewed the Pollak paper for his testimony at the March 6 hearing, concluding, "there is really no study here."[15] Dr. Beall noted the following flaws and deficiencies:

> (1) "There were no controls in this particular [study]"; (2) "It is a reporting of incidences that have occurred at two different [dialysis] units [and] there are no statistical analyses of the incidences"; (3) "There is no comparison of incidences to those occurring with [single use of dialyzers]"; (4) "There are indications that dialyzer function decreases with multiple reuse and there is no comparison over time of reuse"; (5) "They have not analyzed the extent to which multiple [re]use impairs, or not, the ability of the [dialyzer] filters to function effectively and the consequence effects on the patient"; (6) "There were no statistical analyses of the data that they did have so that the level of probability of change was never reported"; and (7) "There was no real presentation of clinical data, clinical information."[16]

During his later testimony, Dr. Marshall did not challenge or dispute Dr. Beall's critique of the Pollak study.[17]

The August 6, 1986 report on the PHS assessment of reuse, however, makes at least six references to the Pollak study to proffer that this study "suggest[s] that the mortality of dialysis patients is the same or less in patients using reprocessed dialyzers than in those using only new dialyzers."[18] The PHS assessment report, conducted under the supervision of Dr. Marshall, contains no reference to any of Dr. Beall's criticisms of the Pollak study.

Example No. 3. Dr. Marshall also made reference in his testimony on March 6 to a 1980 FDA "Investigation of the Risks and Hazards Associated with Hemodialysis Devices":

> "That study. . . focused on dialyzer reuse and reprocessing and found that patients undergoing dialysis treatment with reused dialyzers were at no greater risk than patients being treated with new dialyzers if adequate reprocessing was performed."[19]

The 1980 FDA report does not, in fact, contain anything even faintly resembling Dr. Marshall's statement. To the contrary, the report states:

> "The issue to be resolved. . . is whether standards. . . can be written for the reuse of dialyzers. At the present time, such

> standards cannot be proposed for two reasons: First, in the absenc of definitive studies, such as the one contemplated by NIH, the necessary criteria to establish standards cannot be formulated. Second, at the present time, manufacturers label dialyzers as being intended for single use only. Unless these issues are resolved, standards related to reuse are not relevant. Currently, no devices to accomplish reuse are commercially available in the United States. The development of such devices in the future will depend upon establishing reuse procedures proven to be safe and effective. Until that has been accomplished, proposal for standards is not indicated."[20]

Referring to this passage in the FDA report, Chairman Heinz observed to the PHS witnesses, "[t]he inference, by the way, is that reuse is not justified." The PHS witnesses did not challenge or dispute the Chairman's observation.[21]

Nonetheless, another false statement erroneously attributed to the FDA's 1980 report was included in a briefing book assembled during the week of August 11, 1986 for Robert Windom, Assistant Secretary for Health and head of PHS. The briefing book, prepared in anticipation of a second Aging Committee hearing on reuse, advised Dr. Windom:

> "[FDA] did a. . . report in 1980, which examined risks and hazards of dialysis; [the report] concluded [that] standards were not needed at that time."[22]

Example No. 4. At the March 6 hearing of the Committee, Dr. Marshall suggested that reuse of dialyzers has been found to be beneficial to patients, compared to single use of dialyzers:

> "The reuse of disposable hemodialysis devices was first proposed by Shaldon in 1963 and reported by Scribner in 1967. Shaldon performed daily dialysis in Britain but was only allowed 3 filters a week by the hospital. This necessitated reuse of the dialyzer. At that time he noted that it was feasible, safe, and associated with fewer complications than was the first use of a new dialyzer. David Ogden later reported the "phenomenon of reaction to new dialyzers," which he associated with the development of respiratory distress, wheezing, malaise, back or chest pain, fever and chills at the beginning of treatment. With recent improvements in dialyzer technology, this syndrome is much milder and associated with weakness, dizziness, and malaise. Aside from virtually eliminating the effects of first use syndrome, reuse has been associated with lower cost."[23]

The assessment report produced under Dr. Marshall's supervision also reflects a view of "first use syndrome" as a medical problem caused by using new dialyzers. The assessment, however, cites a body of research--all published in 1983 and 1984 and presumably available to Dr. Marshall for preparation of his testimony -- which identifies one critical qualification of this view. As the report notes,

> "[dialyzer] biocompatibility. . . is dependent on the material used in the manufacture of the [dialyzer] membrane.[24] Hakim suggested that patients with the first-use syndrome may benefit from dialysis with other types of membranes that cause less complement activation, such as polyacrylonitrile or polymethylemethacrylate,"[25] [emphasis added].

It would appear from this research that many cases of the alleged "syndrome" are in reality due to the incompatibility of certain types of dialyzer membranes with some patients' tissues -- a problem which can be solved by using a different type of dialyzer for those patients.

This conclusion is supported by a 1985 study published by FDA on the subject of patients' hypersensitivity reactions during hemodialysis. The final article was written by two employees of FDA's Center for Devices and Radiological Health (CDRH) but, for unknown reasons, is cited in neither the PHS testimony of March 6, nor the PHS assessment. The study found that certain groups of patients and certain dialyzers were more likely to be incompatible, resulting in adverse patient reactions:

> "The younger age groups have the highest [adverse patient] reactivity, with nonwhites having a significantly higher reactivity than their white counterparts in any age group. . . An analysis of the reaction rates (the number of reactions reported normalized by the number of dialyzers sold) showed some differences among manufacturers. Dialyzers manufactured with cellulose acetate membranes were associated with the lowest rate of reactions, a rate similar to that associated with Cuprophan membranes. As evidenced by the data and discussion above, a low reported [adverse patient] reaction rate may not depend directly on the dialyzer itself, but is significantly affected by the patient population mix that uses a particular brand of dialyzer."[26]

Moreover, additional evidence available to PHS before the hearing suggests that the reported incidence of "first-use syndrome" may be affected by the source of the report. For example, dialysis clinics have an incentive to misclassify under the general label of "first-use syndrome" any adverse patient reaction resulting from improper practice and procedure at the clinic. The CDRH study[27] demonstrated that in over 60% of the reported cases of "first use syndrome" it studied over a two year period, the dialysis facility had failed to follow manufacturer's instructions for preparing the dialyzer prior to patient use. This poor procedure exposes the patient to toxins, such as residual traces of sterilants left over from the manufacturing process, which are supposed to be flushed out prior to use of a new dialyzer. If the dialyzers were properly prepared for use, many of the reactions now being attributed to the "first use" of the dialyzer would not occur during the patient's first use of a new dialyzer.

The impact of the CDRH study is to dramatically circumscribe the range of cases of adverse patient reaction which can legitimately be defined as "first-use syndrome". Indeed, it is possible that there is no such thing as "first-use syndrome" after preventable hypersensitivity reactions between certain patients and dialyzers are properly identified and accounted for.

The failure of PHS witnesses to mention, or to temper their sweeping claim that reuse "virtually eliminat[es] the effects of first-use syndrome" with qualifications from this key CDRH study is particularly puzzling because (1) it adds important new information to the literature on this alleged "syndrome", (2) it was less than a year old at the time of the hearing, and (3) John Villforth, the head of CDRH and supervisor of the principal author of the CDRH report, was a witness at the hearing along with Dr. Marshall.

SECTION VI:

PHS HAS CONSISTENTLY MISLED THE CONGRESS, HCFA, THE DIALYSIS COMMUNITY AND THE PUBLIC ON THE SAFETY OF REUSE

Beginning in 1981, the PHS took the position that reuse of disposable dialysis devices is safe and efficacious, if it is done properly.[1] That position, which remains unchanged, is without foundation. Consequently, the PHS has repeatedly and falsely assured the Congress, the American public, the dialysis community, patients and providers, and HCFA, administrator of Medicare's End Stage Renal Disease (ESRD) program, that there are no dangers associated with reuse.

The genesis of this baseless PHS position was a decision by NIH in 1981 to publish a report, "Multiple Use of Hemodialyzers," without having conducted a Congressionally mandated study of the effects of reuse on dialysis patients.[2] The National Nephrology Foundation, Inc. (NNF) prepared this report under contract with the NIH. The report, which was based on a limited and incomplete study,[3] has served as the very linchpin for the claim that reuse is safe. This, despite the fact that the Congress' 1978 mandate for clinical study of patients subjected to reuse has yet to be conducted by the PHS. Moreover, the private firm, Arthur D. Little, Inc. (ADL), which, under subcontract, conducted the limited research into the effects of reuse on the hollow-fiber dialyzer, sharply criticized the NIH-sponsored report's interpretation of the firm's data.[4]

The ADL complaints and criticisms led to a decision by the DHHS General Counsel that NIH was not required to make public the ADL findings and report. The General Counsel's justification for withholding the ADL report from the public was that, "since the [ADL] subcontract report was submitted to the contractor [the National Nephrology Foundation, Inc.] . . . the Government could not disclose or make public what it did not possess."[5] The ADL report was never released by NIH, thus precluding the opportunity for the public to compare the ADL findings and data with those in the NIH-sponsored report, "Multiple Use of Hemodialyzers."

The highly controversial 1981 NIH report, however, was erroneously cited early this year by the Office of Management and Budget (OMB) as "conclud[ing] that re-use is both safe and effective, given the proper cleaning method is employed."[6] The OMB used this NIH report to justify to HCFA reductions in Medicare's dialysis reimbursement rates which become effective on October 1, 1986.[7]

Following publication of the "Multiple Use of Hemodialyzers" report in 1981, individuals within DHHS continued to raise concern among themselves regarding the lack of clinical study of the effects of reuse on dialysis patients. Much, if not most, of this concern focused on the use by many clinics of formaldehyde, a potent toxin, for sterilizing the throw-away devices.[8]

For example, in February 1982, an ESRD Strategic Work Group reported to the Secretary of DHHS four areas of "critical importance", including the need for "a major clinical trial to determine effects of hemodialyzer reuse."[9]

Yet, in September 1982, an FDA official wrote to a dialysis patient regarding the patient's concern over the use of formaldehyde in reprocessing disposable dialyzers:

> "Most individuals are chronically exposed to formaldehyde, which is a natural product found in many foods and water in trace amounts. In the human body it is rapidly transformed into formic acid, which

> is in turn transformed into carbon dioxide and water which are normal metabolic products. . . The FDA is unaware of any report of adverse reactions due to the long-term use of dialyzers disinfected with formaldehyde solutions."[10]

What this FDA response neglected to tell this patient was that neither the FDA nor anyone else knows what effects patients may be suffering from reuse, simply because controlled clinical study has yet to be conducted; that these clinics are not required to report adverse reactions, acute or long-term, because these facilities are not federally regulated; and that threat of malpractice lawsuit from patients and their families serves as a strong incentive for clinics not to report adverse and injurious reactions.

In late 1983, the FDA sent a letter similar to the one cited above to a member of the Pennsylvania State Senate;[11] and HCFA wrote to U.S. Representative James Coyne, 8th District, Pennsylvania,[12] and to U.S. Senator Arlen Specter of Pennsylvania, indicating safety in reuse.[13]

During this same period, between April and November 1982, 27 patients, who had been subjected to reuse in a Louisiana dialysis clinic, were infected with a virulent mycobacteria; and, by September 1983, 15 of the 27 patients had died. An article on this infection outbreak appeared in the May 13, 1983 edition of the Centers for Disease Control (CDC) Morbidity and Mortality Weekly Report (MMWR). This Louisiana episode spurred new interest at DHHS and PHS in problems associated with reuse.[14]

Following the Louisiana infection outbreak, the CDC initiated a study to analyze the water supplies of 150 dialysis clinics. Results as of April 1984 showed that 35 of the 39 clinics surveyed at that point had mycobacteria in their water supplies.[15] A CDC scientist observed, "I think the problem of mycobacterial contamination is much more widespread than we ever anticipated."[16]

Three months later, in August, the FDA responded a second time to a dialysis patient who had written to President Reagan about his concerns regarding reuse of disposable devices. The FDA falsely assured the patient that "data supports the safety and efficacy of the reuse of dialyzers."[17]

While the FDA was responding to the dialysis patient in August, a committee within the FDA's Center for Devices and Radiological Health (CDRH) was busy gathering information on serious problems associated with reuse and other practices and procedures in dialysis clinics. A report by the "Dialysis Use Committee" was issued in October 1984 and contained 39 pages of deficiencies and examples of poor quality control. The report cited cases of bacterial contamination, inadequate disinfection procedures, toxic materials in water supplies contaminating the blood of patients, and others.[18] This report, however, was not distributed outside the FDA's CDRH.[19]

By December of 1984, the PHS was, or should have been, aware that there were serious and life-threatening problems with the reprocessing and reuse of disposable devices in dialysis clinics. At least 15 patients had died from bacterial infection in one clinic alone, the FDA's Center for Devices and Radiological Health had catalogued serious deficiencies in its October 1984 report, and the CDC's own study had revealed widespread mycobacterial contamination of water supplies in dialysis clinics.

Nevertheless, on December 31, 1984, the Assistant Secretary for Health, DHHS, wrote to the National Kidney Patients Association:

> "The majority of dialysis facilities reprocess [dialyzers], lending support to the premise that multiple use of [dialyzers] can now be

> considered standard medical practice. . . [S]urely, for the majority of dialysis patients, an honest and trusting relationship with the physician providing treatment should be a guarantee of quality treatment whether reuse is practiced or not."[20]

Complaints to Congress from patients opposed to reuse increased as more and more dialysis clinics turned to reuse, primarily, if not solely, for financial reasons. Responding to these complaints, Congressman Fortney Stark, Chairman of the House Ways and Means Committee's Subcommittee on Health, wrote to both HCFA and FDA concerning allegatons that some clinics were "forcing" their patients to reuse. Mr. Stark expressed concern over the lack of "generally accepted guidelines or regulations defining standards for reuse," and the lack of "informed consent" for patients.[21] HCFA Administrator Carolyne Davis responded:

> "I am acutely aware of the controversy [over the absence of standards for reuse]. . . At the present time, I believe the question of reuse is a medical practice issue which, in the absence of specific guidelines from the [FDA], should be decided by the patient's physician."[22]

Dr. Davis also informed Mr. Stark that a private industry group, the Association for the Advancement of Medical Instrumentation (AAMI), had conducted a "recent study" that addressed reuse.[23] AAMI actually was attempting to draft guidelines for reuse with unofficial input from FDA and CDC personnel. Elaboration on the failure to develop adequate standards/guidelines can be found in Section II of this report.

CDC scientists at that time, however, were becoming increasingly concerned, perhaps even frustrated and alarmed, over the lack of even a voluntary set of comprehensive guidelines for reprocessing and reuse. A CDC scientist sharply criticized that section of the draft "AAMI Recommended Practice" guidelines which dealt with water quality, and wrote:

> "In addition to the major outbreak of infections in Louisiana there have been two instances where non-tuberculous mycobacterial infections in dialysis patients were reported to CDC. . . [R]esults of our survey of 115 dialysis centers. . . show that over 80% of these centers had mycobacteria in water associated with the center. These organisms cannot be ignored. . . How many outbreaks. . . among. . . patients are needed to indicate that 2% formaldehyde is an inadequate procedure?"[24]

Despite the fact that these kinds of serious concerns were being expressed internally by knowledgeable PHS personnel,[25] publicly, dialysis patients were, in effect, being told not to worry about reuse. For example, HCFA wrote to a concerned patients group in July 1985, "Much data has been published which supports the safety and efficacy of reuse."[26]

On March 6, 1986, following four months of investigation, the Special Committee on Aging conducted a hearing on "Disposable Dialysis Devices: Is Reuse Abuse?". The PHS testimony contained the very same false assurances, references to flawed studies and malinterpretations of incomplete data that PHS and HCFA had been using for years to quell the fears of dialysis patients, and to justify a "hands-off" approach to reuse. For example, the principal witness for PHS, John Marshall, Ph.D., Director of the National Center for Health Services Research and Health Care Technology Assessment (NCHSR/HCTA), testified that the PHS "consider[s] that ample experience exists today to suggest that no health hazards for dialyzer reuse have been demonstrated."[27] Elaboration on additional examples can be found in Sections IV and V of this report.

Dr. Marshall himself admitted after the hearing that the PHS testimony was "flawed" and contained "serious omissions and inaccuracies

. . . based on facts made available" to Dr. Marshall prior to the hearing.[28] Dr. Marshall's admission came in July after his agency, NCHSR/HCTA, was near to completing a health technology assessment of the safety and efficacy of reuse. A detailed discussion of this PHS assessment, which also turned out to be seriously flawed and incomplete, can be found in Section VII of this report.

During the March 6 hearing, Chairman Heinz questioned why the FDA could not impose its Good Manufacturing Practices (GMP's) regulation on dialysis clinics to ensure quality control in reprocessing. The FDA witness stated that his agency had considered reprocessing in dialysis clinics as "the practice of medicine," and not subject to regulation.[29] However, as early as February 1986, the FDA's own Reuse Committee, a group that had been working for several years to formulate a "reuse policy", believed that "FDA [had] the authority under the existing law to regulate processing of devices for reuse whether it is carried out by the original manufacturers, health professionals or others."[30] This belief was based on advice from the FDA's General Counsel.

Further clarification on this issue was provided to the Secretary on April 16, 1986, as he was preparing to respond to Chairman Heinz's written request for FDA to impose the GMP's on reprocessors.[31] The Secretary was informed:

> "[The FDA's] General Counsel says a legal argument can be made for imposing GMP's or not enforcing them on dialysis clinics. It therefore becomes a policy decision."[32]

Several days later, on April 21, a second memorandum was forwarded to the Secretary, and stated:

> "FDA strongly opposes applying GMP standards. . . and has taken the position that we should tell Senator Heinz in [your response] that the GMP regulations do not apply, in order to 'close the door' to further pressure from the Senator."[33]

Secretary Bowen apparently took the FDA's advice in responding to Chairman Heinz. Contrary to the opinion of the FDA's own General Counsel, that imposing GMP's was a "policy decision", the Secretary wrote to Chairman Heinz:

> "Our legal counsel reminds us that the Federal Food, Drug, and Cosmetic Act. . . specifically exempts from device regulation 'practitioners licensed by law to prescribe or administer drugs or devices and who manufacture, prepare, propagate, compound or process drugs or devices solely for use in the course of their professional practice.' As you can see, the statutory language raises potential legal issues."[34]

Soon after the March 6 hearing, a series of infection outbreaks among patients in clinics practicing reuse began to surface. Some patients were hospitalized, and at least one death may have been caused by infection. The CDC and FDA became aware of these outbreaks, beginning in early April, and initiated investigations at clinics in California, Texas, Florida and Georgia, beginning in early May of this year.

In mid-June, CDC epidemiologists began to draft an article for publication in its Morbidity and Mortality Weekly Report (MMWR) to alert and warn the medical community about the threat of infection in reuse. The article went through at least seven drafts prior to publication on June 27, with much input from FDA and some from NCHSR/HCTA on what information the article should and should not contain.[35]

According to CDC, both FDA and NCHSR/HCTA did not want any mention in the article of controlled clinical study, much less, the need for such studies.[36] CDC accommodated both agencies by removing from the article the statement:

> "There are. . . no controlled clinical studies validating the safety or assessing the risk to patients of the practice of the reuse of disposable [dialyzers], nor are there controlled clinical studies comparing the morbidity and mortality of patients being dialyzed with new dialyzers with that of patients being dialyzed with reprocessed 'single use only' dialyzers. "The conduct of this assessment, which was announced at the March 6 hearing, was, according to Dr. Marshall's own staff, allotted an unreasonably short length of time for completion.[37]

CDC also, at the request of FDA,[38] removed at least one other statement from the article prior to publication:

> "There are. . . no federal standards for ensuring the functional or microbiologic quality of 'single use only' [dialyzers] reprocessed in [dialysis] clinics."[39]

On June 25, 1986, two days prior to publication of the MMWR article, James S. Benson, Deputy Director of the FDA's Center for Devices and Radiological Health, wrote to Frank Young, M.D., Commissioner of FDA:

> "We've been told that CDC plans to release the article this Friday. . . . Our staff have been in contact with both the authors of the article and reviewing officials to suggest some changes to bring it in line with the statements about dialysis reviews made by Dr. John Marshall [Director, NCHSR/HCTA] and John Villforth [Director, CDRH, FDA] at the [Senate Aging Committee] hearing on [dialysis reuse] this past March."[40]

When asked in sworn deposition to explain what he meant by bringing the article "in line" with the March 6 testimony, Benson stated, "when Marshall and Villforth [made] statements at the hearing, as far as I am concerned, that's stating a policy, Public Health Service policy."[41] The "policy" referred to by Benson, and articulated by the PHS witnesses at the March 6 hearing, was that there is no need for enforceable federal standards, or for controlled clinical study to determine safety and efficacy of reuse for dialysis patients.

CDC epidemiologists, however, believe that such standards, as well as clinical study, are needed in light of their recent investigations of infection outbreaks in five dialysis clinics.[42]

Dr. Marshall himself recommended to the Assistant Secretary of Health on July 8, 1986:

> "The PHS needs to take a clinically and scientifically based stand with respect to this issue. We need to communicate that directly and emphatically to [HCFA], even if that means recognizing that our earlier testimony was flawed."[43]

All copies of this memo, however, were retrieved by Dr. Marshall after it had been distributed to the Assistant Secretary for Health and others at a meeting on July 8. According to Dr. Marshall, he gathered up all copies after a deputy[44] to the Assistant Secretary commented to Dr. Marshall during the meeting: "This [memo] is pretty frank. You weren't planning to distribute this, were you?"[45]

Dr. Robert Windom, Assistant Secretary for Health, imposed a final deadline of August 6 for Dr. Marshall and his agency, NCHSR/HCTA, to submit the health technology assessment report on the safety and efficacy of reuse. Dr. Marshall met the deadline and, on August 7, began drafting a one-page memo for Dr. Windom's signature, under which the assessment report would be forwarded to William Roper, M.D., Administrator of HCFA. NCHSR/HCTA normally provides HCFA with an assessment report on medical issues if there is potential for a contemplated or proposed HCFA action to impact negatively on a Medicare or Medicaid program, or on the beneficiaries themselves.

There was, indeed, good reason for the PHS to forward the NCHSR/HCTA assessment report on reuse to HCFA because that agency was preparing to publish on August 15, 1986 a final regulation to reduce the dialysis reimbursement rates in order to save money. These reductions, however, will encourage, if not force, an increase in reuse among the 1,300 dialysis clinics; and, consequently, many more dialysis patients will be subjected to the potentially dangerous risks associated with reuse. Elaboration on the effects of the rate reductions can be found in Section III of this report.

Dr. Enrique Carter, who directly supervised the NCHSR/HCTA's assessment, recalls that he discussed with Dr. Marshall on August 8, Dr. Marshall's draft memo for Dr. Windom's signature, and that he disagreed with the content of the memo.[46] Dr. Marshall does not recall any such discussion. Instead, he recalls Dr. Carter having said that the memo was was accurate.[47]

Dr. Carter, however, testified that he "took exception" with the accuracy of certain statements in the draft memo that Dr. Marshall had prepared for Dr. Windom's signature.[48] For example, the memo contained the statement:

> "The findings indicate that when physicians and facilities exercise appropriate quality control over reprocessing. . . patient outcomes appear to be no different in facilities that reuse dialyzers than for those facilities where single use is the normal operating mode."[49]

When asked why he took exception with the accuracy of this statement, Dr. Carter responded:

> "Well, there were two things that were foremost in my mind. One is, we don't know what the specific quantifiable risks are for reusers as opposed to non-reusers. And the second reason was that in the one study that had actual quantified data. . . on the specific [patient] complication rate [showed that] only in the facilities that practiced reuse [were] there complications."[50]

Dr. Carter also disagreed with a second statement in Dr. Windom's memo to Dr. Roper, which reads:

> "The absence of reported increases in the morbidity and mortality given increased practice of reuse suggests that virtually all facilities are following adequate procedures."[51]

Dr. Carter said he "took exception" with this statement "for the same reason. . . because I need to see data, hard data, that is systematically gathered on that position."[52]

Moreover, these statements contained in Dr. Windom's memo to Dr. Roper did not in any way reflect the findings and conclusions in the assessment report itself. Yet, this inaccurate and misleading memo was forwarded to HCFA on August 11, 1986. Also, on that same day, the NCHSR/HCTA belatedly received reams of documents and reports from both the FDA and CDC, which further confirmed that the statements contained in Dr. Windom's memo were, indeed, inaccurate and misleading. Nonetheless, five days later, on August 15, HCFA published its regulation to reduce Medicare's dialysis reimbursement rates, effective October 1, 1986.

SECTION VII:

THE PUBLIC HEALTH SERVICE ASSESSMENT OF THE SAFETY AND EFFICACY OF REUSE IS FLAWED AND INCOMPLETE

The Public Health Service announced at the Aging Committee's March 6, 1986 hearing that, although "ample experience suggests" that there are "no health hazards" in reuse, it would initiate a health technology assessment. John Marshall, Ph.D., the principal witness for the PHS and Director of the National Center for Health Services Research and Health Care Technology Assessment (NCHSR/HCTA), said his agency would conduct a "formal assessment" of the safety, efficacy and cost-effectiveness of dialyzer reuse.[1]

This action by the PHS seemed promising and responsible. On the very same day of his testimony, however, Dr. Marshall wrote a note, stamped "CONFIDENTIAL" to his superior, the then Acting Assistant Secretary for Health, Donald MacDonald. The full text follows:

> "Prior to today's hearing with Senator Heinz on this subject, I had assumed that we could carry out the assessment within the 60-day period that was specified in your March 5 memorandum. However, the original plan was to have used this as a way of deferring a response to the Senator. Unfortunately, it was decided that I should promise in the testimony to carry out this assessment. This means that the process will be carried out under the careful scrutiny of committee staff, probably Mr. Mitchie. The substantive part of our analysis is completed. We had to do that for the testimony. There is nothing new that will be found. But, because of the sensitivity of this and the activation of constituency groups as a result of these hearings, I think it best that we be allowed 90 days for carrying out the study. That will allow time for following our formal process which includes a notice in the Federal Register and solicitation of comments from the cognizant specialty and subspecialty groups. In this case we will probably solicit comments from the patient groups as well. They won't have facts to give us but will give us strident opinions. I don't expect that Mr. Mitchie will perceive the study as anything but a whitewash and consequently that will be the Senator's view. But I think we can forestall at least some criticism by going to 90 days. If you concur I will send you a formal request for an extension without any of this background. (signed) John E. Marshall, Ph.D., Director.[2] [Emphasis added]

Dr. Marshall's note raises three fundamental questions: (1) how could he state with certainty that "nothing new" would be found, when his agency had not even begun the assessment?; (2) how could the NCHSR/HCTA conduct a "formal assessment" in three months or less, when, on average, such a study takes nine months or more?; and (3) why did this particular assessment have to be completed so quickly?

These questions relate to certain facts and circumstances that later became known to Aging Committee staff and are enumerated below:

1. NCHSR/HCTA had never before assessed any aspect of reusing these disposable devices. There was little more than a week in which to prepare Dr. Marshall's testimony. This was hardly time enough for Dr. Marshall's short-staffed agency[3] to collect, much less to analyze, all existing data and information on reuse. As one of the only two NCHSR/HCTA staff persons assigned to the assessment put it, "Reuse is a very complex issue."[4]

2. In preparing for his testimony on March 6, Dr. Marshall relied heavily upon FDA, CDC and NIH for information and data. Unfortunately, some of this information, including reports and other pertinent internal

documents in the files of these agencies, was not provided at that time to Dr. Marshall.

3. The NCHSR/HCTA did not publish its notice in the Federal Register soliciting comment and information from any and all sources until April 10,[5] more than a month after Dr. Marshall had stated to Dr. MacDonald, "There is nothing new to be found."

4. The NCHSR/HCTA initially was given only 60 days, until June 13, to complete the assessment and to submit a report to the Office of the Assistant Secretary for Health. This deadline fell only three days after the end of the 60-day public comment period which had been advertised in the Federal Register. Dr. Enrique Carter, the NCHSR/HCTA official who closely supervised the assessment, agreed that it was "extraordinary, if not unique," for him to have been given only three days following the end of the comment period to produce a report.[6]

5. Prior to the March 6 hearing, HCFA had begun to draft a proposed regulation at the behest of the Office of Management and Budget (OMB) to reduce Medicare's dialysis reimbursement rates. If the assessment found that there was hazard associated with reuse, it would be difficult for HCFA to justify the reductions, simply because reducing these rates would be seen as likely to encourage, if not force, increased reuse.[7]

NCHSR/HCTA relied on FDA, CDC and NIH in preparing testimony.

During the week prior to Dr. Marshall's testimony on March 6, NCHSR/HCTA staff were provided with a voluminous briefing book from FDA which contained materials from that agency, as well as from CDC and NIH, on reuse. Much of this material was over-simplified or incomplete, or both, and, therefore, misleading with regard to safety and efficacy of reuse. For example:

o A briefing paper on "The Reuse Of Hemodialysis Systems" prepared by FDA stated: "Studies have shown that reuse is safe as non-reuse if dialyzer reprocessing is done adequately. Reuse patients [are] shown not to be at a disadvangtage compared to other patients. Listed as supporting these statements are the FDA 1980 report, "Investigation of Risks and Hazards Associated with Hemodialyzers," and the 1981 NIH-sponsored report, "Multiple Use of Hemodialyzers."[8] Neither of these reports supports the briefing paper statements. Elaboration on these reports can be found in Section V of this report. Also, the briefing paper cited FDA as having taken "action to help assure adequate reprocessing" by its involvement in the drafting of voluntary guidelines for reprocessing. These guidelines, however, only attempt to address reprocessing of the dialyzer filter, and not the blood lines, transducer filter and dialyzer caps.[9]

o FDA also failed to provide Dr. Marshall with a 1984 report including 39 pages of serious deficiencies in reprocessing/reuse and other dialysis practices and procedures,[10] as well as other documents pertaining to reprocessing/reuse and dating back to November 1983.[11]

o The CDC's briefing paper for Dr. Marshall referred to its "Surveillance of Dialysis-Associated Diseases and Hemodialyzer Reuse," an annual survey conducted jointly by CDC and HCFA. But this paper failed to inform Dr. Marshall that this survey, which solicits voluntary reporting from dialysis clinics, is unvalidated and does not even ask specific questions regarding increased incidence of bacterial infections in patients.

o The NIH provided Dr. Marshall and NCHSR/HCTA with an October 9, 1981 letter in which a subcontractor to the NIH-sponsored study, "Multiple Use of Hemodialyzers," complained that data had been misrepresented and malinterpreted.[12] Not provided, however, was the attachment -- a list of 33 specific complaints and suggested revisions pertaining to the report on the study.[13] NIH also failed to inform NCHSR/HCTA that this four-year-old controversy had never been resolved.

NCHSR/HCTA solicited additional information from FDA, CDC, NIH, and the public.

In addition to publishing a notice in the Federal Register on April 10, 1986, NCHSR/HCTA forwarded letters to the FDA, NIH and CDC seeking any and all information on the safety and efficacy of reuse.[14]

A week later, Dr. Carter and his assistant, Martin Erlichman, visited the Committee offices to review the Committee's reuse investigation files. Dr. Carter requested copies of numerous internal DHHS documents which NCHSR/HCTA had not been provided, but were pertinent to the assessment of reuse.

Meanwhile, both the FDA and CDC had become aware, beginning in early April, of infection outbreaks at clinics practicing reuse,[15] but delayed informing NCHSR/HCTA of these incidents. First to apprise the NCHSR/HCTA of these outbreaks was the Aging Committee staff, in mid-May.[16]

Responding to the NCHSR/HCTA's April 9 request for comments and additional information on reuse, the FDA wrote that agency on May 28:

> "All information concerning the issue of reuse***is already available to [NCHSR/HCTA] as part of the package prepared for the Senator Heinz hearing. The Office of Device Evaluation [at FDA] has no additional information."[17]

Dr. Carter testified in sworn deposition that he was distressed and angered by the FDA response, because he knew by May 28 that this was not a true statement.[18]

By mid-June, the CDC and FDA had begun to collaborate on publishing an alert regarding the recent infection outbreaks,[19] but the CDC failed to mention the outbreaks in its June 20 response to NCHSR/HCTA's request for additional information.[20] The NCHSR/HCTA did not receive official written notice from FDA on the infection outbreaks until June 25.[21]

NCHSR/HCTA continued to have difficulty in obtaining FDA and CDC documents and data pertinent to the assessment of reuse.[22] Most of the reports and other written materials concerning the infection outbreaks, results of the FDA-sponsored state surveys of dialysis clinics, and serious deficiencies in dialysis device manufacturing practices were not provided to NCHSR/HCTA until August 11, after the assessment had been completed.[23]

Upon receiving many of these items from FDA and CDC in late July and early August, Aging Committee staff shared them with NCHSR/HCTA.[24] But it was too late for NCHSR/HCTA to include this material in its assessment. Section I of this report reviews much of the voluminous materials that NCHSR/HCTA was not provided prior to completion of the assessment.

NCHSR/HCTA was given too little time for the assessment.

Normally, it takes NCHSR/HCTA nine months or more to complete an assessment, including the gathering and analysis of information and data and drafting of a report. In the case of the reuse assessment, however, the agency was given far less time.

Consequently, a substantial amount of information and data pertinent to the assessment could not be analyzed and incorporated into the August

6, 1986 assessment report. Principal among these materials are: (1) a report from the State of California on an FDA-sponsored survey of 31 dialysis clinics, which revealed serious deficiencies and problems in reprocessing practice and procedure; (2) the CDC's investigations of five clinics, in Texas, Florida, California and Georgia, which revealed problems and deficiencies similar to those discovered in the FDA-sponsored surveys of dialysis clinics in California and the District of Columbia; and (3) the CDC's findings that two, and possibly three, of the five clinics it investigated this year showed a statistically significant increase in patient infections as the number of reuses of dialyzers increased.

From the very outset of the assessment, NCHSR/HCTA personnel questioned whether it could be completed within 60 days, the first deadline that was set by Dr. Marshall.[25] Martin Erlichman and Dr. Enrique Carter, both of whom were assigned to conduct the assessment, were concerned about this short timeframe. Erlichman felt that this deadline was "unreasonable,"[26] and Dr. Carter recalls having repeatedly raised this issue with Dr. Marshall as the assessment progressed.[27] Dr. Marshall, however, stated that Dr. Carter had "no difficulty" with the deadline, and did not voice any concern until early June.[28]

Nonetheless, NCHSR/HCTA intended to meet the first deadline of June 10 for completing the assessment.[29] This plan was scrapped, however, when NCHSR/HCTA received comments from Chairman Heinz on June 9[30] in response to the NCHSR/HCTA's April 10 Federal Register notice.[31] Appended to the Chairman's comments were numerous internal DHHS, PHS and HCFA documents, the Committee's March 6 hearing record, and the petition filed by the Chairman and five other members of the Committee with the FDA, seeking to have that agency impose its Good Manufacturing Practice (GMP's) regulation on dialysis clinics practicing reuse. Chairman Heinz's comments pursuaded NCHSR/HCTA and the PHS to spend another 30 days on the assessment, and the deadline was extended to July 10.

On July 8, however, Dr. Marshall briefed the newly installed Assistant Secretary for Health, Robert Windom, M.D., on the progress of the assessment, and the fact that CDC and FDA were investigating recent infection outbreaks at at clinics in four states. Dr. Windom granted Dr. Marshall a second 30-day extension on the deadline for an assessment report.[32]

In the meantime, both FDA and CDC continued to generate reports and other documents, including findings and conclusions pertaining to the infection outbreaks in Texas, California, Florida and Georgia. FDA was also awaiting reports from Massachusetts, California and Ohio, where FDA had sponsored surveys of conditions and practices and procedures in dialysis clinics. The PHS, FDA and CDC began providing copies of these voluminous materials to the Aging Committee on July 29, but failed to share the same materials with NCHSR/HCTA prior to August 6, the new and final deadline for the assessment report.[33]

Aging Committee staff apprised Dr. Marshall and his staff of these materials in late July, and began providing the documents to NCHSR/HCTA on August 2. Receipt of these materials, which were highly pertinent to the assessment, prompted Dr. Carter to request another delay in completing the report for Dr. Windom.[34] Dr. Carter believed that there was a need to analyze these documents to ensure that the assessment would be complete and thorough.[35] Dr. Marshall denied Dr. Carter's request and forwarded the report to Dr. Windom on the afternoon of March 6.[36]

Termination of the assessment accommodated HCFA.

The incomplete and flawed assessment report was forwarded to William Roper, M.D., Administrator of HCFA, on August 11, five days prior to HCFA's publication of dialysis reimbursement rate reductions.[37]

Dr. Marshall denies that there was any connection between the August 6 deadline for the assessment report and HCFA's August 15 publication of the rate reductions. "It was merely coincidental," according to Dr. Marshall.[38] Sworn testimony of other witnesses and internal PHS documents, however, strongly indicate otherwise.

The PHS, as well as NCHSR/HCTA, were aware of HCFA's intention to propose the rate reductions prior to the Aging Committee's March 6 hearing on reuse. The first indication of this awareness was contained in a March 5 memo to Dr. Marshall from Donald Ian MacDonald, M.D., the then Acting Assistant Secretary for Health.[39] This was the memo in which NCHSR/HCTA was requested to conduct the assessment and, in it, Dr. MacDonald referred to HCFA's "interest" in the "cost implications" of reuse.[40] "The importance of this issue," wrote Dr. MacDonald, "dictates a timely analysis."[41]

HCFA's interest in reducing the rates was also brought up in testimony at the March 6 hearing.[42] Both Dr. Marshall and Bartlett Fleming, the then Acting Deputy Administrator of HCFA, testified that they did not know whether or not a reduction in rates would encourage an increase in reuse.[43] "If [HCFA publishes the proposed reductions]," said Fleming, "there would be ample time for all interested parties to comment [and we would] make a determination as to what to do."[44] HCFA published its proposed regulation for rate reductions on May 10.[45]

One month later, on June 6, Dr. Marshall prepared a memo clearly indicating that PHS was, indeed, considering how the assessment findings would impact on HCFA.[46] This memo, which was signed by Dr. MacDonald and addressed to Donald Newman, Under Secretary for DHHS, stated:

> "At the [March 6] hearing, Dr. Marshall agreed to conduct an assessment of. . . reprocessing and reuse. That assessment will be completed on June 10 and will be transmitted with recommendations to HCFA at that time. NCHSR/HCTA has found no new evidence contradictory to the position which we took in testimony."[47]

This plan, however, was struck down by Chairman Heinz's voluminous submission on June 9 of internal PHS documents to NCHSR/HCTA, and the assessment deadline was extended.

HCFA again received prominent mention in a July 8 memo from Dr. Marshall to Dr. Windom. The memo began by stating:

> "As HCFA continues to ratchet down the reimbursement rate for hemodialysis, concern has grown on the part of hemodialysis patients and the Congress, with respect to the safety and efficacy of the reuse of dialysis equipment. . . As events have unfolded, it is clear that the March 6 testimony was not based on all the germane facts. . . We need to ascertain a PHS position and inform HCFA of that position so as to minimize embarrassment for the Department. . . We need to communicate that directly and emphatically to [HCFA], even if that means recognizing that our earlier testimony was flawed"[48] [emphasis supplied].

Dr. Marshall later denied in sworn testimony that this memo was meant to warn Dr. Windom that PHS assessment should not be used to accommodate HCFA's desire to lower the reimbursement rates.[49]

Two days later, on July 10, a memo generated within the Office of the Assistant Secretary for Health discussed the need to keep HCFA informed on the progress of the NCHSR/HCTA's assessment.[50] A copy of this note, which was written by Anne Desmond and addressed to Bob Rickard, was shared with Dr. Marshall.[51] Item No. 1 in this note reads as follows:

> "Ask John Marshall if he has kept Bill Roper or Henry Desmarais [of HCFA] informed of the progress of his [assessment]. *HCFA is proceeding with a new End Stage Renal Disease Program reg[ulation], that will reduce reimbursement rates* for kidney dialysis; obviously, if that happens, dialysis centers will want to shift to even more dialysis filter reuse, since its cheaper. Therefore, *if John Marshall reaches conclusions that reuse is a health hazard, it could put HCFA folks in a quandry [sic]*."[52] [Emphasis added]

Dr. Marshall said he never followed up on this note, and did not keep HCFA abreast of his findings.[53] Dr. Marshall stated in sworn testimony:

> "I didn't see that as a germane issue. . . [O]nce I knew that there was a [proposed] regulation, I was very, very careful not to discuss it with [Dr.] Henry [Desmarais] or people on his staff. . . But they knew -- they knew we were doing this assessment and they weren't asking me about it and I wasn't telling them about it. I mean they weren't worried about the outcome. And I don't think that they were thinking that it was or would be a problem."[54]

Dr. Marshall, however, did recall having informed Dr. Desmarais that "there would be no recommendations to HCFA in [the assessment report], that it would all be recommendations dealing with things that I thought the PHS agencies should do."[55] Further, Dr. Marshall recalled Dr. Desmarais having remarked to him on another occasion that "the timing of my [July 8] memo to Dr. Windom was not real helpful to [HCFA]."[56]

As HCFA was preparing to publish its regulation to reduce the dialysis reimbursement rates, Dr. Marshall, with the assistance of Dr. Carter, drafted a cover memo for transmittal of the assessment report to Dr. Windom. This August 6 memo stated:

> "While the current information does not provide evidence that multiple use is without hazard, neither does it demonstrate sufficient grounds to abandon reuse. We have determined that *there are potential hazards associated with reprocessing of [disposable dialysis devices]*; that long term effects of the disinfectant used in reprocessing need to be better understood; and that *there is insufficient patient education material to assist patients in making an informed consent for dialyzer reuse*. There is a need to take steps to assure that facilities choosing to reuse observe practices consistent with optimal patient safety and clinical effectiveness. . . It is incumbent on the [PHS] to identify and to publicize the optimum practices for assuring safety and quality."[57] [Emphasis added]

Dr. Carter, who had closely supervised the drafting of the report, believed this one-page memo accurately characterized the findings and conclusions of the assessment.

On the following day, however, Dr. Marshall drafted a second one-page memo -- this one, for Dr. Windom's signature, under which the assessment report would be forwarded to HCFA.[58] The content of this memo, also meant to summarize the assessment findings and conclusions, bore no resemblance whatsoever to Dr. Marshall's August 6 summary to Dr. Windom. For example, there was no mention of "potential hazards," nor of the need for adequate informed consent of patients.[59] Instead, this second memo indicated that "patient outcomes" were "no different" in clinics that reused as opposed to those that did not reuse.[60] It also falsely suggested that "virtually all facilities are following adequate procedures."[61] Prior to being forwarded to HCFA on August 11, Dr. Windom's memo was reviewed and revised by no less than 10 individuals from the Office of the Assistant Secretary for Health, CDC, NIH, FDA and the Chief Counsel for the PHS.[62]

Dr. Carter "took exception" with the accuracy of the memo, and so informed Dr. Marshall.[63] Later, in sworn testimony, Dr. Marshall did not recall such a discussion with Dr. Carter. To the contrary, he recalled that Dr. Carter had agreed with the content.[64] He further testified that he thought that Dr. Windom's August 11 memo was a "more accurate and comprehensive statement" than the August 6 memo.[65]

The statements in Dr. Windom's August 11 memo referred to above do not appear anywhere in the findings and conclusions of the assessment report.[66] Martin Erlichman, the primary drafter of the assessment report, characterized these statements in the memo as untrue and inaccurate.[67] Dr. Carter found the content of the memo to be unacceptable, and labelled the statement suggesting that "virtually all facilities" were "following adequate procedures" as a "non sequitur".[68]

Nonetheless, Dr. Marshall denied in sworn testimony that the purpose of the August 11 memo was to accommodate the needs of HCFA by providing that agency with justification to go forward with the rate reductions.[69]

But John Villforth, Director of the FDA's Center for Devices and Radiological Health, stated otherwise. Villforth, who was one of the 10 participating PHS officials in the review and revision of the August 11 memo, stated the following in sworn deposition:

> "My understanding was that there was a concern on the part of HCFA that the assessment report not say something inconsistent and there was a need to transmit that information to HCFA -- inconsistent with what approach HCFA might be taking in their final [regulation for the rate reductions]. . . [T]his was an attempt to give them the information -- the tools to draw their final conclusion, HCFA's final conclusion."[70]

SECTION VIII: RECOMMENDATIONS

1. Until further information is available, providers of dialysis services who reuse "single use only" dialyzers, should review their practices and experience and assess whether alternatives to one-time use of dialyzers are appropriate and optimally beneficial to patients. At present, there are no controlled clinical studies validating the safety or assessing the risk to patients of the practice of the reuse of disposable dialysis devices. Further, there are no controlled clinical studies comparing the morbidity and mortality of patients being dialyzed with new dialyzers with that of patients being dialyzed with reprocessed "single use only" dialyzers.

2. The Secretary of the Department of Health and Human Services should direct the Public Health Service to undertake a truly thorough, objective, and complete assessment of the problems associated with reuse. Due to the variety of complex issues surrounding reuse, and the lack of knowledge within federal regulatory agencies, the Congress, the scientific community, as well as dialysis patients, their clinics, and their physicians, the Public Health Service promised Chairman Heinz it would undertake a thorough assessment of the issue. The assessment that was performed, however, was done in an unreasonably, and unusually short time. Consequently, it was flawed, incomplete, and misleading.

3. The Secretary should direct the Centers for Disease Control to follow the recommendation of its own epidemiologists, and immediately initiate a comprehensive investigation of a national sample of dialysis clinics to determine the extent of poor practice and procedure in reprocessing and reuse. Since 1977, when clinics began to reuse dialysis devices, the PHS has relied on an annual CDC survey of clinics for information concerning the adverse effects of reuse on patients. Since the reporting of outbreaks to the CDC is voluntary, and the survey does not include specific questions dealing with increased rates of infection due to reuse, the reliability and validity of the survey is questionable. Nevertheless, the PHS has not attempted to collect verifiable data on the safety and efficacy of reprocessing dialysis devices.

4. The Secretary should direct the FDA to promulgate uniform, enforceable Federal standards to promote safety and efficacy in reuse of disposable dialysis devices, as well as all other disposable medical devices that are reprocessed for reuse. In 1978, Congress passed the Medical Device Amendments to the Federal Food, Drug and Cosmetic Act to give the FDA authority to promulgate regulations that will ensure proper manufacturing and processing of products. Since then the FDA has developed no standards for any "Class Two" medical devices, including disposable dialysis devices. While manufacture of new devices must meet the standards of the Good Manufacturing Practices, there are no federal standards for ensuring the functional quality of "single use only" dialysis devices that have been reprocessed.

5. The new DHHS Interagency Reuse Task Force should give thorough and serious consideration to the findings and recommendations contained in this report when formulating a policy for the reuse and reprocessing of dialysis devices. On September 5, 1986 Assistant Secretary for Health Windom wrote a letter to Chairman Heinz announcing the establishment of an Interagency Task Force on Dialyzer Reuse. According to Dr. Windom, the Task Force will provide a focal point for dialysis reuse, advise him of the progress of the forthcoming PHS assessment, and develop an implementation plan for DHHS policy on the issue.

6. The Task Force should be expanded to include representatives of dialysis patients, clinicians, and device manufacturers who favor reuse, and other representatives from these groups that are opposed to reuse. This action will ensure the views of all parties interested in the reuse

of disposable dialysis devices are heard. The Task Force is currently comprised of members of Dr. Windom's staff, as well as representatives of NIH, CDC, FDA, NCHSR/HCTA, and the Chief Counsel of the Public Health Service.

7. HCFA should immediately withdraw its regulation for reducing Medicare's dialysis reimbursement rates, so as not to encourage or force an increase in the reuse of dialysis devices. Since increasing profits by reducing the cost of dialysis treatment is the primary reason for reuse, reducing the Medicare dialysis reimbursement rates will provide greater incentive for clinics to reprocess dialysis devices. In addition, despite assurances made to this Committee by HCFA, there is evidence that many dialysis clinics are threatening patients; telling them they must either submit to reuse, or seek treatment elsewhere.

8. The FDA should require dialysis clinics that practice reuse to abide by the requirements of the Good Manufacturing Practices in accordance with, and as provided for in, existing law and regulations. The language of the GMPs already applies to reprocessors. In addition, an internal task force within FDA has said that reprocessing of dialysis devices in ESRD clinics falls within the language and purpose of the regulations. Moreover, the Federal Food, Drug, and Cosmetic Act gives the Secretary of DHHS, through the FDA, the authority to promulgate regulations to ensure the safe manufacture and use of medical devices.

9. The Secretary of DHHS should require that controlled preclinical and clinical studies be performed to assess the dangers associated with the reuse of all dialysis devices, including the dialyzer, blood tubing, dialyzer caps, and transducer filter. In 1978, the Congress ordered the DHHS to perform a study to determine the effects of reuse on the safety and efficacy of dialysis devices. The phase of the research that was to involve controlled clinical study was never performed. Since that time, no controlled clinical study has been initiated.

10. The Secretary of DHHS should direct HCFA to enforce the patients' rights provisions of the Medicare conditions of participation, and thereby protect the legally guaranteed rights of dialysis patients. Committee staff have learned that these regulations are being violated by many dialysis clinics across the country. Nevertheless, HCFA only inspects about one-half of all ESRD clinics each year, and has failed to follow through on its stated intent to enforce these laws. Prompt action by HCFA should help dialysis patients to maximize their independence and self-control over their own health, an express purpose of the current regulations.

11. DHHS should require dialysis clinics to inform their patients in writing about the risks associated with reuse and reprocessing, and allow the patients the freedom to choose whether or not to reuse their dialysis devices. Although federal regulations require that dialysis clinics allow the patient to participate in planning his/her treatment, and prevent his/her discharge for other than medical reasons, many clinics force patients to reuse. These clinics tell the patient that if s/he refuses to reuse, s/he must relocate to another facility for treatment. Other clinics fail to provide the patient with information that describes the risks associated with reuse.

12. HCFA should direct all clinics to stop reusing bloodlines and tubing, transducer filters, and dialyzer caps, under penalty of decertification of the facility. This action is needed because of the total lack of standards, voluntary guidelines, or even data regarding safety and efficacy, for reuse of these devices.

NOTES TO SECTION I.

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[*] Staff of the U.S. Senate Special Committee on Aging conducting this investigation were: David H. Cunningham, David G. Schulke, Michael J. Werner, Christopher C. Jennings, Susan L. Beecher, and James F. Michie.

[1] Draft Final Report entitled "California Dialysis Facility Study", Principle Investigator, James E. Barquest, Ph.D, P.E., Device Program, Food and Drug Branch, California Department of Health Services, August 12, 1986, Sacramento, California, p. 31.

[2] Ibid, p. 19.

[3] Memorandum dated October 23, 1984, from Dialysis Use Committee Chairman, William C. Dierksheide, Ph.D., FDA Office of Training and Assistance, to FDA Center for Devices and Radiological Health (CDRH) Senior Staff, Subject: Dialysis Use Committee Report. Attached to the memo is the Report of the Dialysis Use Committee.

[4] Note 1, supra.

[5] CDC had advised in a June 1981 National Institutes of Health report that a 4% formaldehyde solution was needed to adequately protect against these deadly bacteria. Yet, the agency has been unwilling to assert that clinics should abide by this recommendation, or that it is necessary for proper reprocessing. See July 29, 1986 memorandum from Martin S. Favero, Ph.D. of CDC to the Director of CDC, in which it is noted that, as a result of their "investigation of the [Baton Rouge] bacteremia outbreak and additional laboratory studies, the recommendation was made that if centers had reprocessing programs and if aqueous formaldehyde was used as the chemical germicide, at least 4% formaldehyde should be used. . . These recommendations were made in several scientific publications and, although never formally published in an MMWR article or as an official CDC guideline, are perceived among the dialysis community as CDC recommendations." Nevertheless, two-thirds of the clinics continue to use disinfectant solutions weaker than 4%, some containing 2% or less formaldehyde. See Committee staff report, in "Disposable Dialysis Devices: Is Reuse Abuse", hearing before the Special Committee on Aging, U.S. Senate, March 6, 1986, Senate Hearing 99-693, pp. 99-133.

[6] Memorandum dated August 1, 1986, to Director, CDC, from the Director, Hospital Infections Program, CDC, relating findings of Georgia outbreak investigations.

[7] Note 1, supra, pp. 34-37.

[8] Ibid, supra, p. 38.

[9] Ibid, p. 38.

[10] Association for the Advancement of Medical Instrumentation, August 1985 Revision, "Recommended Practice for Reuse of Hemodialyzers (Proposed)", pp. 26-32 (please note that this recommended practice has now been issued in final form). See also this report, section on Standards, for further discussion of this problem.

[11] Transcript of Proceedings, U.S. Senate Special Committee on Aging, Deposition of John J. Murphy, M.D., Washington, D.C., September 8, 1986, pp. 27-29, 39.

[12] Ibid, pp. 30-1.

[13] Ibid.

[14] "A Comprehensive Review of Hemodialysis Equipment and Related Peripheral Support Equipment: Efficacy, Efficiency, and Safety", prepared by the Department of Consumer and Regulatory Affairs, Government of the District of Columbia, May 1986, Volume I, pp. ii-v. Problems identified in blood tubing and transducer protector filter reprocessing are both predictable and troubling, because these devices are being reprocessed and reused in the absence of any industry or government guidelines or standards. Under these circumstances, dialysis patients are being subjected to unproven and highly suspect practice and procedure.

[15] Draft letter dated June 2, 1986, addressed to Geraldine Flynn, R.N., administrator of the Inglewood, CA clinic, by John J. Murphy, M.D., CDC Epidemiological Investigations Officer. See note 33, infra, regarding the lesser likelihood of patient hypersensitivity to cellulose acetate dialyzers with single use.

[16] Note 11, supra, pp. 58-60.

[17] Note 1, supra, pp. 54-55. This was the same disinfectant used at the Georgia clinics where outbreaks occurred this year.

[18] Transcript of Proceedings, U.S. Senate Special Committee on Aging, Deposition of John J. Murphy, M.D., Washington, D.C., September 8, 1986, pp. 29, 58-9, 76; see also draft letter dated June 2, 1986 from John J. Murphy, M.D. and Steven L. Solomon, M.D., to Geraldine Flynn, R.N., dialysis clinic administrator; see also entries in log book of Dr. Murphy between May 8 and 13, 1986, especially pages marked "Reuse Sheets", which depict pattern of reuse over a four month period at the Inglewood clinic.

[19] This letter from the manufacturer of the disinfectant was prompted by a complaint from the administrator on June 6, 1986. It was not until June 27 that the manufacturer wrote to FDA to file a Medical Device Report regarding the pyrogenic reactions afflicting patients at the two clinics. By then it was too late; FDA was onsite at the manufacturer on June 27 (see entry for June 27, 1986 in the chronology of health hazard evidence, above.)

It is noteworthy that the manufacturer of the disinfectant used by these two clinics argued that the disinfectant was not at fault. Instead, he alleged that the outbreak was caused by failure of the Reverse Osmosis (RO) water treatment system at the Brunswick center. On the vulnerability of these systems to operator/user error, see the California Health Services Department study done for FDA, discussed in the body of this section, above; also, note that the October 23, 1984 Report of the Dialysis Use Committee (see entry in health hazards chronology, above) has an attachment which notes the following:

> "PROBLEM: Premature Failure of Reverse Osmosis Membrane.
> CLINICAL CONSEQUENCES: Sepsis.
> DESCRIPTION OF PROBLEM: Reverse Osmosis devices are used for removing organics, bacteria, viruses, and pyrogens. Premature failure of reverse osmosis membranes may occur when water entering the reverse osmosis system is inadequately treated. High alkalinity, and high concentrations of electrolytes (calcium/magnesium, iron/manganese) in the incoming water can cause premature failure of the reverse osmosis membrane. Gram-negative bacteria apparently can penetrate small defects in the reverse osmosis membrane that are not normally detectable and colonize on the downstream part of the reverse osmosis unit."

[20] Letter dated December 17, 1985 to John Villforth, Director, Center for Devices and Radiological Health, FDA, from Frank E. Samuel, Jr., President, Health Industry Manufacturers Association.

[21] See entry in logbook of John J. Murphy, M.D., during Inglewood, California outbreak, May, 1986.

[22] Committee staff attempted to keep the authors of the PHS assessment apprised of significant documentation regarding CDC's investigations of bacteremia outbreaks, Medical Device Reports to FDA, and Establishment Inspections of poor manufacturing practices at makers of dialysis devices and disinfectant, going so far as to provide copies of pertinent FDA and CDC documents to NCHSR staff at home during weekends. The deadline imposed by PHS, however, precluded incorporating this information in the assessment. For further information, please see Section VII of this report, regarding the assessment.

[23] Note 3, supra. A handwritten annotation on the cover memorandum is addressed to "JH/JB" and states:

> "This may come in handy if we get pulled down by the Ways and Means Committee on hemodialysis. Although this report isn't focused on reuse much at all, we could use it to pinpoint the variety of user-related problems aside from reuse that occur -- the downside to all of this is the Committee's rec. to not do something on a broad educational track. The State contracts were one activity we did highlight for Rostenkowski's staff."

Regarding the "State contracts", the Use Committee recommended that the "Dialysis System Investigations Contracts" -- now referred to by FDA as the Tri-State Study -- "be designed to address the user-related problems listed in this report. The Committee believes that information about the frequency of occurence may arise as data are obtained from the contracts. Once completed, the Center [CDRH] could focus upon some of the more prevalent problems." Two years later, in referring to the results of the Tri-State Study, the chief of the CDRH stated: "This is anecdotal. It is a snapshot. It is not statistical. It confirms the suspicions. It started out with the Dierksheide report [and]. . . I think it confirmed there are some problems with problems." See Transcript of Proceedings, U.S. Senate Special Committee on Aging, Deposition of John Villforth, September 4, 1986, pp. 97-100. See also discussion of District of Columbia and California State studies, in the body of this section.

[24] Note 14, supra.

[25] Note 1, supra.

[26] Ibid.

[27] "Disposable Dialysis Devices: Is Reuse Abuse?", Hearing before the Special Committee On Aging, U.S. Senate, 99th Congress, Second Session, Washington, D.C., March 6, 1986, Serial No. 99-16, pp. 54-55.

[28] Hakim RM, Fearon DT, Lazarus JM, Biocompatibility of Dialysis Membranes: Effect of Chronic Complement Activation. Kidney International 1984, 26:194-200.

[29] Ivanovich P, Chenoweth DE, Schmidt R, et al. Symptoms and Activation of Granulocytes and Complement with Two Dialysis Membranes. Kidney International 1983, 24:758-63.

[30] Henderson LW, Cheung AK, Chenoweth DE, Choosing a Membrane. American Journal of Kidney Diseases 1983, 3(1):5-19.

[31] Walker F, Lindsay R, Sebbald W, et al. Changes in Pulmonary Vascular Tone During Early Hemodialysis. Transcript of the American Society for Artificial Internal Organs 1984, 30:168-72.

[32] Hakim RM, Breillatt J, Lazarus JM, et al. Complement Activation and Hypersensitivity Reactions to Dialysis Membranes. New England Journal of Medicine 1984, 311(14):878-82

[33] Villaroel F, Ciarkowski AA. A Survey on Hypersensitivity Reactions in Hemodialysis. Artificial Organs 1985, 9(3):231-38. This study narrowly circumscribes the range of cases of adverse patient reaction which can legitimately be defined as "first-use syndrome", thereby adding important new information to the literature on this alleged "syndrome". The failure of PHS witnesses to mention this key CDRH study is puzzling particularly because (1) it was less than a year old at the time of the hearing, and (2) the head of CDRH, John Villforth, was a witness at the hearing along with Dr. Marshall. For further information on the accuracy of this testimony, please see the end of chapter V of this report.

See also note 15. Dialyzers made with acetate membranes have the lowest rate of patient hypersensitivity upon first use, but are associated with a higher risk of blood infection if they are reused. See also in this connection discussion of CDC findings in 1986 outbreaks, in body of this report.

[34] Ibid.

[35] Ibid.

[36] California Dialysis Facility Study, Draft Final Report to FDA, August 12, 1986. Prinicipal Investigator: James M. Barquest, Ph.D., P.E., California Department of Health Services, Food and Drug Branch, Device Program, Sacramento, California.

[37] Ibid, p. 39.

[38] Note 26, supra, p. 46. Similar views were shared with Committee staff in an interview with Rafael Cestero, M.D., Clinical Director, Acute Medical Services, Monroe Community Hospital, University of Rochester, February 5, 1986:

> "I quite reusing in 1980. I find it difficult to accept the validity of studies that purport to prove reuse is safe. If you are going to reuse, you pretty much have to use formaldehyde. But I don't think formaldehyde should be infused intravenously into patients. We decided, at the time we were reusing, that the most times we should reuse a dialyzer was six times. We reused hollow-fiber dialyzers. We stopped reuse because we had one patient who had had triple bypass and got hepatitis and therefore we stopped reuse. We reviewed the situation and found that our patients were doing better and feeling better on single use, and so we never went back to reuse. We have 100 patients in our clinic."
>
> "First use syndrome is quite uncommon. I think it is often an early reaction to the dialyzer. PAN [polyacrlonitrile] membrane is probably less allergic than others. Perhaps reuse is a suitable situation for a small fraction of patients. But using this as a rationale to justify reuse for all patients in a clinic has been greatly overworked. In my 17 years of practice, I've seen no more than half-a-dozen patients with first-use syndrome. I have had, however, some patients who were severely allergic to a particular dialyzer."

[39] See Note 11, supra, p. 57. CDC investigator John J. Murphy, M.D. stated to Committee staff: ". . . you asked about whether CDC was going to participate in an investigation [at Daytona Beach]. We did consider it at one time. As of right now I don't think there's any strong interest in going to look there." Dr. Murphy went on to explain that "it was a small number of cases", perhaps too few to draw conclusions from.

This outbreak was significant enought to warrant high level CDC attention, however. A June 13, 1986 memorandum from Dr. Murphy's supervisor, Steven L. Solomon, M.D., to James M. Hughes, M.D., Director, Hospital Infections Program, CDC, based upon limited inquiries of CDC investigators into the outbreak at Daytona Beach, states:

> " . . .between March 24 and April 1, 1986 there had been seven patients at [clinic name]-Daytona who had experienced adverse reactions during hemodialysis. . . On May 27, 1986 Dr. Murphy and I contacted [official of clinic firm]. . . [who] was aware of the problems in California and Florida, and indicated that there were either five or six [firm name] centers currently using [brand of disinfectant] in a comparison trial with other [firm clinics] which were using [another disinfectant]. . ."

[40] Note 11, supra, p. 26.

[41] Note 6, supra. See also the June 13, 1986 memorandum cited in note 39, supra, which notes the following in regard to this problem:

> "We now have information suggesting the occurrence [of] five clusters of adverse reactions among patients undergoing maintenance hemodialysis at four different hemodialysis centers which were using [brand of disinfectant] for reprocessing of disposable dialyzers. In all five instances representatives of the [disinfectant manufacturer] conducted investigations prior to the involvement of local, state, or federal health officials. In at least three of the five instances notification of FDA by [manufacturer] occurred after involvement of [manufacturer] have come to light through other means. In at least one instance specimens obtained by [manufacturer] were reportedly handled in a manner that rendered them inappropriate for testing."

[42] Note 11, supra.

[44] See Note 1, supra, pp. 29-30, 58-9, 85-95. See also 6/9/86 entry in the log of Steven L. Solomon, M.D., of the Hospital Infection Program, CDC; see also 6/17/86 memorandum from Artis M. Davis, CSO, Dallas District, FDA, to Theodore L. Rotto, Director, Investigations Branch, Dallas District, FDA; see also 6/13/86 memorandum to file from H. Frank Newman, M.D., Regional Medical Officer, FDA.

[45] Note 21, supra.

NOTES TO SECTION II.

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[1] Transcript of Proceedings, U.S. Senate Special Committee on Aging, Deposition of John C. Villforth, Washington, D.C., September 4, 1986, p. 88. See also 21 U.S.C. 360j(f) (1982) which authorizes the Secretary of DHHS to prescribe regulations governing medical devices. For a discussion of the applicability of the Good Manufacturing Practices (GMPs) to reuse, see notes 14-40 of this section.

[2] "Investigation of the Risks and Hazards Associated with Hemodialysis Devices", prepared for the FDA by the Regional Kidney Disease Program, Minneapolis Medical Research Foundation, June 1980.

[3] Ibid., p. 343.

[4] Ibid.

[5] A January 1, 1981 letter to E.L. Kelly, Acting Director of Special Programs, HCFA, from Dr. Nancy Cummings, Assoc. Director of NIAMDD, NIH, and Dr. Robert Wineman, Program Director, Chronic Renal Disease Program, NIAMDD, NIH, said: "Clinical Trial of Multiple Use of Hemodialyzers. . . [would have] a low contribution to basic medical science." A January 15, 1981 memo to Dr. Cummings from Ronald Schwartz, Acting Assistant Inspector General for Health Care and Systems Review noted that "[NIAMDD] ha[s] discontinued. . . research efforts into the efficacy and safety of kidney dialyzer reuse."

[6] Memorandum to Edward Kelly, Acting Director, Office of Special Programs, HCFA, from Nancy Cummings, M.D., Associate Director, KUBD/NIADDK, NIH.

[7] "Disposable Dialysis Devices: Is Reuse Abuse?", Hearing before the Special Committee on Aging, U.S. Senate, 99th Congress, Second Session, Washington, D.C., March 6, 1986, Serial No. 99-16, p. 120.

[8] Ibid.

[9] Memo to Assistant Director, Education and Communication, Center for Disease and Radiological Health, FDA, from Mark Barnett, FDA, July 6, 1983.

[10] Note 7, supra, p. 121. See also Minutes of meeting, FDA Reuse Committee, November 9, 1983.

[11] Note 7, supra, p. 121. Note that these guidelines are now published in final form.

[12] Association for the Advancement of Medical Instrumentation, "Recommended Practice for Reuse of Hemodialyzers (Proposed)", August 15 Revision.

[13] The March 6 Aging Committee staff report noted that "Over the past decade, scores, perhaps hundreds of different 'recipes' for reprocessing disposable dialysis devices have been devised and used." Note 7, supra, p. 113.

[14] 21 U.S.C. 301 et seq.

[15] See 21 U.S.C. 360j(f) (1982) which authorizes the Secretary to prescribe regulations governing medical devices.

[16] 43 Fed. Reg. 31508 (July 21, 1978).

[17] 21 C.F.R. 820.3(k) (1985). Note that the regulations impose a series of requirements on the reprocessing of "critical medical devices", including hemodialysis devices. See 21 C.F.R. 820.100 (1985), 21 C.F.R. 820.115 (1985), 21 C.F.R. 820.116(a) (1985), 21 C.F.R. 820.3(l) (1985), 21 C.F.R 820.60(d) (1985), 21 C.F.R 820.1(a) (1985).

[18] 21 C.F.R. 820.20 (1985); 21 C.F.R. 820.60 (1985).

[19] 21 C.F.R. 820.25 (1985). The study performed by the California Department of Health for the FDA found that this was a problem in many clinics. In particular, the report said: "Educational requirements [for the job of reuse technician], when specified, were minimal. For example, one facility's requirement was that the person be at least 16 years of age and be able to read and write English." Draft Final Report entitled "California Dialysis Facility Study", Investigator, James Barquest, Ph.D., P.E., Device Program, California Department of Health Services, August 12, 1986, p. 19.

[20] See 21 C.F.R. 820.20 (1985); 21 C.F.R. 820.60 (1985); 21 C.F.R. 820.116 (1985).

[21] The genesis for the position that reuse is a medical practice decision, and therefore not regulated by the Federal government, arose from the May 6, 1981 memo from Dr. Nancy Cummings to Edward Kelly, that said in part, "[D]ialyzer reprocessing is considered by us and by practicing nephrologists to be a component of medical practice." See note 6, supra. See also letter from Dr. Edward Brandt, Ass't. Secretary for Health, DHHS, to Kidney Patients Association. Brandt said issues surrounding reuse relate "to the physician-patient relationship and [are] beyond the scope of the legal authority of the [FDA] or the [DHHS]. Further, he said "this is not an area in which FDA or HHS should properly be involved." In addition, Robert Streimer, a HCFA official wrote to the same group saying "the general question of reuse is a medical practice issue and one which should be decided by the patient's physician."

[22] Note 7, supra, p. 71.

[23] Ibid.

[24] Ibid.

[25] Note 1, supra, p. 42.

[26] Note 1, supra, p. 87.

[27] Transcript of Proceedings, U.S. Senate Special Committee on Aging, Deposition of James S. Benson, September 3, 1986, p. 113. Note that Mr. Villforth agreed that regulation would cost approximately $700,000 per year, but he argued that complications with dialysis reuse is not considered a high priority problem within FDA, and therefore, it would be an inefficient use of FDA resources. Note 1, supra, p. 91.

[28] Ibid., p. 114. For a discussion of HCFA's regulatory role see section III of this report.

[29] These arguments were discussed in a petition for rulemaking submitted to the FDA (See 5 U.S.C. 551 et seq. (1982)) by Committee staff on May 12, 1986. At present, FDA has not responded to the petition, nor has Chairman Heinz been given any indication as to when a response will be coming. See Deposition of John Villforth, Note 1, supra, pp. 93-94.

[30] Memorandum to HHS Secretary Bowen, from Acting Assistant Secretary for Health Donald McDonald, April 16, 1986.

[31] Note 1, supra, p. 88. See also Note 27, supra, p. 142.

[32] Memorandum from Anna Boyd, Policy Coordinator/Health, Executive Secretariat, DHHS, to HHS Secretary Bowen, April 21, 1986. This memo said ". . .FDA strongly opposes applying GMP standards. . . and has taken the position that we should tell Senator Heinz. . . that the GMP regulations do not apply, in order to close the door to further pressure from the Senator. . ." Letter from Ass't. Sec. for Health McDonald to HHS Secretary Bowen, April 16, 1986.

[33] Working Paper: Policy Considerations for the Reprocessing of Devices, FDA Reuse Committee, February 24, 1986, p. 15.

[34] Ibid., p. 19.

[35] Reuse Option Paper, FDA Reuse Committee, May 16, 1986, p. 10.

[36] It is well known that the primary reason for the increase in the number of clinics that reuse is due to economic considerations. See "Public Health Assessment, The Reuse of Hemodialysis Devices Labeled for 'Single Use Only'", August 6, 1986, p. 1. "The major stimulus for reuse and reprocessing is the potential for cost savings." Ibid., p. 49. See also Note 35, supra, p. 1, 3. See also FDA Reuse Committee, Reuse Option Paper, July 11, 1986, p. 6, 7. See also AAMI Recommended Practice, March 1985, p. 1. See also Note 7, supra, p. 27. See also Transcript of Proceedings, U.S. Senate Special Committee on Aging, Deposition of Enrique D. Carter, M.D., Washington, D.C., September 12, 1986, p. 118.

[37] FDA Reuse Committee, Options for the Managing of Reusing of Medical Devices, July 11, 1986, p. 14.

[38] Title XVII of the Social Security Act, 42 U.S.C. 1395 et seq. (1982), distinguishes between medical practice, which is exempt from federal regulation and supervision, 42 U.S.C. 1395 (1982), and medical services provided by medical facilities, which are subject to federal review, 42 U.S.C. 1395x (1982).

[39] See 42 C.F.R. 405.1500 et seq. (1985). For example, HHS inspects and certifies health facilities, but does not inspect and certify physicians in their offices. Since HHS inspects and certifies ESRD clinics, the site of reprocessing, it is clear they are considered health facilities, and not physicians' practices.

[40] Note 33, supra, p. 14.

[41] Association for the Advancement of Medical Instrumentation, "Recommended Practice for Reuse of Hemodialyzers", July 28, 1986, Final Version. Section 1.2 states: "This recommended practice does not cover the reuse of blood tubing sets."

[42] "Public Health Service Assessment, the Reuse of Hemodialysis Devices Labeled for 'Single Use Only'", August 6, 1986, p. 53.

[43] Note 35, supra, p. 15.

[44] Draft final report entitled "California Dialysis Facility Study", performed for the FDA by James M. Barquest, Ph.D., P.E., Chief Investigator, Device Program, Food and Drug Branch, California Dept. of Health Services, 714 P St., Room 400, Sacramento, Calif. 95814.

Submitted by a letter to Claudia Woodring, Contracting Officer, FDA, from James Barquest, Ph.D., California Dept. of Health Services, August 12, 1986.

[45] Transcript of Proceedings, U.S. Senate Special Committee on Aging, Deposition of John J. Murphy, September 8, 1986, p. 72.

[46] Letter to Jan Graf, R.N., Clearwater, Fla., from Wally Jansen, Vice President for Quality Assurance, Renal Systems, Inc., June 17, 1986.

[47] Note 1, supra, p. 43, 87-88.

[48] Note 35, supra, p. 11.

[49] Ibid., p. 11.

NOTES TO SECTION III.

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[1] FDA Compliance Policy Guide, Chapter 24, No. 7124.23, Nov. 11, 1977.

[2] FDA Compliance Policy Guide, Chapter 24, No. 7124.16, July 1, 1981.

[3] "Disposable Dialysis Devices: Is Reuse Abuse?", Hearing before the Special Committee on Aging, U.S. Senate, 99th Congress, Second Session, Washington, D.C., March 6, 1986, Serial No. 99-16, p. 120.

[4] A letter to J. Kevin Rooney, from Walter Gundaker, Director Office Compliance, CDRH, FDA, April 19, 1984 stated "We have considered [reuse] to be in the realm of the practice of medicine, which is controlled by other governemntal bodies, more specifically, state authorities." See also a letter to Mr. Robert Rosen, dialysis patient, from John Villforth, Director, Center for Devices and Radiological Health, FDA, September 12, 1984 which stated "Your concerns about the reuse of [dialyzers]...are matters outside the jurisdiction of the FDA". See also a memo to Ronald Schwartz, Acting Assistant, Inspector General for Health Care and Systems Review, DHHS, from Acting Director, Bureau of Medical Devices, FDA, April 2, 1981.

[5] FDA Reuse Committee, Reuse Option Paper, May 16, 1986, p. 5.

[6] Ibid., p. 18.

[7] Transcript of Proceedings, U.S. Senate Special Committee on Aging, Deposition of James S. Benson, September 3, 1986, p. 113. Note that Mr. Villforth agreed that regulation would cost approximately $700,000 per year, but he argued that complications with dialysis reuse is not considered a high priority problem within FDA, and therefore, it would be an inefficient use of FDA resources.

[8] Ibid., p. 114. For a more detailed discussion of FDA's regulatory responsibilities, see section 2 of this report.

[9] Memorandum from Philip Nathanson, Director, Health Standards and Quality Bureau, HCFA, to HCFA Regional Administrators, June 5, 1985, p. 2.

[10] Ibid.

[11] Ibid., p. 3.

[12] 42 C.F.R. 405.2138 et seq. (1985).

[13] Ibid.

[14] 42 C.F.R. 405.2138(a) (1985).

[15] 42 C.F.R. 405.2138(b) (1985).

[16] 42 C.F.R. 405.2138(c) (1985).

[17] 42 C.F.R. 405.2138(d) (1985).

[18] 42 C.F.R. 405.2138(e) (1985).

[19] Note 3, supra, p. 111.

[20] Note 3, supra, p. 112.

[21] Addendum II, Final Statement of Reasons, Notice of Proposed Regulation, #R-88-83, 22 C.A.C. 75197, August 25, 1986, p. 10

[22] Ibid.

[23] Draft of proposed regulation, #R-88-83, 22 C.A.C. 75197, June 25, 1986, p. 29.

[24] Ibid.

[25] Note 3, supra, p. 5.

[26] Note 3, supra, p. 10.

[27] Note 3, supra, p. 7.

[28] Note 3, supra, p. 7.

[29] Note 3, supra, p. 9.

[30] Note 3, supra, p. 10.

[31] Note 3, supra, p. 76.

[32] Note 3, supra, p. 80.

[33] Note 3, supra, p. 81.

[34] Note 3, supra, p. 81.

[35] Note 3, supra, p. 81. Mr. Fleming stated that in the meantime, the patient should seek treatment at "back-up hospitals" that have dialysis treatment on emergency basis. Ibid., p. 82.

[36] Note 3, supra, pp. 86, 88.

[37] Note 3, supra, p. 88.

[38] Note 3, supra, p. 87.

[39] Letter to U.S. Senator John Heinz, Chairman, Special Committee on Aging, from Bartlett S. Fleming, Associate Administrator for Management and Support Services, June 13, 1986.

[40] Ibid.

[41] Ibid.

[42] Letter from Robert Taylor, Associate Regional Administrator, Health Standards and Quality, HCFA, to Michael Jhin, M.D., Executive Director and Chief, Temple University Hospital, Renal Dialysis Facility, July 17, 1986.

[43] Ibid.

[44] Ibid.

[45] Ibid.

[46] See article, "Dialysis Patients his Re-use of Blood Tubes", The Washington Times, August 19, 1986, p. 6B.

[47] The patients argued that they did not want to relocate because they had been obtaining treatment at that facility for many years, and because they would have to travel a great distance to another facility. Letter to administrator of dialysis clinic, from Michael Schuster, Legal Counsel for the Elderly, American Association of Retired Persons, August 18, 1986.

[48] Memo dated August 15, 1986 to Regional Administrator, HCFA Region III, from Thomas Morford, Acting Director, Health Standards and Quality Bureau, HCFA (see Appendix IV for copy of memo).

[49] Notice accompanying proposed regulation, HCFA, August 15, 1986, p. 34.

[50] Letter to U.S. Senator John Heinz, Chairman, Special Committee on Aging, from DHHS Secretary Otis Bowen, M.D., September 18, 1986.

[51] Memorandum entitled "End Stage Renal Disease (ESRD) Payment Rate Calculation", Office of Management and Budget, February 21, 1986, p. 2.

[52] "Multiple Use of Hemodialyzers", report by Manhattan Kidney Center/National Nephrology Foundation, Norman Deane, M.D., Principal Author, June 30, 1981.

[53] Ibid., The report stated: "Utilization of the specified procedures with suitable process and quality control will result in a reprocessed [dialyzer] equivalent in terms of function, cleanliness and sterility to a new hollow fiber [dialyzer]."

[54] In an October 9, 1981 letter to Dr. Deane, John Ketteringham, Vice-President of Arthur D. Little, Inc. criticized the final version of the Deane study saying that data was misinterpreted, and misused.

[55] It is well known that the primary reason for the increase in the number of clinics that reuse is due to economic considerations. See "Public Health Service Assessment, The Reuse of Hemodialysis Devices Labeled for 'Single Use Only'", August 6, 1986, p. 1. "The major stimulus for reuse and reprocessing is the potential for cost savings", Ibid., p. 49. See also FDA Reuse Committee, Reuse Option Paper, May 16, 1986, p. 1, 3. See also FDA Reuse Committee, Reuse Option Paper, July 11, 1986, pp. 6, 7. See also AAMI Recommended Practice, March 1985, p. 1. See also Note 3, supra, p. 27. See also Transcript of Proceedings, U.S. Senate Special Committee on Aging, Deposition of Dr. Enrique D. Carter, M.D., Director, Office of Health Technology Assessment, NCHSR/HCTA, PHS, September 12, 1986, p. 118.

[56] Transcript of Proceedings, U.S. Senate Special Committee on Aging, Deposition of Dr. Enrique D. Carter, M.D., Director, Office of Health Technology Assessment, NCHSR/HCTA, PHS, September 12, 1986, p. 123.

[57] Note 49, supra, p. 16.

[58] Memo to William Roper, M.D., Administrator, HCFA, from Robert Windom, M.D., Assistant Secretary for Health, DHHS, August 11, 1986.

[59] Ibid.

[60] Memo to DHHS Assistant Secretary for Health Robert Windom, M.D., from John Marshall, Ph.D., Director, NCHSR/HCTA, August 6, 1986. For more evidence of the misuse and malinterpretation of the PHS assessment, See Transcript of Proceedings, U.S. Senate Special Committee on Aging, Deposition of John C. Villforth, Washington, D.C., September 4, 1986, pp. 119-120, Mr. Villforth notes:

> "My understanding was that there was a concern on the part of HCFA that the Department assessment report not say something inconsistant with the approach HCFA might be taking in their Federal Register publication. . . [The August 11 memo] was an attempt to them the information -- the tools to draw their final conclusion."

See also Transcript of Proceedings, U.S. Senate Special Committee on Aging, Deposition of John E. Marshall, Washington, D.C., September 11, 1986, p. 86. See also section 7 of this report.

[61] Ibid.

[62] Transcript of Proceedings, U.S. Senate Special Committee on Aging, Deposition of Martin Erlichman, Washington, D.C., September 10, 1986, p. 139.

[63] Note 55, supra, pp. 97-99.

[64] Ibid.

[65] Note 49, supra, p. 15.

[66] Ibid.

NOTES TO SECTION IV.

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[1] A January 1, 1981 letter to E. L. Kelly, Acting Director, Office of Special Programs, HCFA, from Nancy B. Cummings, M.D., Associate Director, NIAMDD, NIH, and Robert Wineman, Ph.D., Program Director, Chronic Renal Disease Program, NIAMDD, NIH. RE: research and/or demonstrations relating to ESRD.

[2] Ibid.

[3] "Disposable Dialysis Devices: Is Reuse Abuse?", Hearing before the Special Committee On Aging, U.S. Senate, 99th Congress, Second Session, Washington, D.C., March 6, 1986, Serial No. 99-16, pp. 114-118.

[4] Ibid.

[5] Oct. 23, 1984 Memorandum to, CDRH Senior Staff, FDA, from William C. Dierksheide, Ph.D., Dialysis Use Committee Chairman, Office of Training and Assistance, CDRH, FDA. RE: Dialysis Use Committee Report.

[6] Ibid.

[7] See Section I of this report for discussion of these findings.

[8] Note 3, supra.

[9] Note 3, supra, pp. 60-61.

[10] Ibid.

[11] June 20, 1986 letter to Enrique D. Carter, M.D., Director, Office of Health Technology Assessment, NCHSR/HCTA, PHS, from Gary R. Noble, M.D., Assistant Director for Science, CDC, PHS; also, Transcript of Proceedings, U.S. Senate Special Committee on Aging, Deposition of John J. Murphy, M.D., Washington, D.C., September 8, 1986, pp. 31-33.

[12] "Public Health Service Assessment, Hemodialysis Devices Labeled For 'Single Use Only'", August 6, 1986, p. 28; also, Transcript Of Proceedings, U.S. Senate Special Committee on Aging, Deposition of John J. Murphy, M.D., Washington, D.C., September 8, 1986, pp. 33-34.

[13] Note No. 11, supra.

[14] Note No. 11, supra.

[15] An article, "Bacteremia Associated with Reuse Of Disposable Hollow-Fiber Hemodialyzers," published in the CDC's Morbidity and Mortality Weekly Report, June 27, 1986, pp. 417-418.

[16] July 8, 1986 memorandum to James Hughes, M.D., Director, Hospital Infections Program, CDC, PHS, from John J. Murphy, M.D., and Steven L. Solomon, M.D., Epidemiologists, Hospital Infections Program, CDC, PHS; also, Transcript of Proceedings, U.S. Senate Special Committee on Aging, Deposition of John J. Murphy, M.D., Washington, D.C., September 8, 1986, pp. 36-39.

NOTES TO SECTION V.

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[1] "Disposable Dialysis Devices: Is Reuse Abuse?", Hearing before the Special Committee On Aging, U.S. Senate, 99th Congress, Second Session, Washington, D.C., March 6, 1986, Serial No. 99-16.

[2] Ibid.

[3] Ibid.

[4] "The In-Vitro Evaluation Of Certain Issues Related To The Multiple Use Of Hemodialyzers", final report to the National Nephrology Foundation, Inc., February 1981, Contract No. 1-AM-9-2214.

[5] October 9, 1981 letter to Norman Deane, M.D., National Nephrology Foundation, Inc., from John M. Ketteringham, Ph.D., Vice President Arthur D. Little, Inc.

[6] Transcript of Proceedings, U.S. Senate Special Committee on Aging Deposition of John E. Marshall, Ph.D., Washington, D.C., September 11, 1986, pp. 136-138.

[7] Transcript of Proceedings, U.S. Senate Special Committee on Aging Deposition of Enrique D. Carter, M.D., Washington, D.C., September 12, 1986, pp. 139-152.

[8] Ibid.

[9] Ibid.

[10] "Public Health Service Assessment, The Reuse Of Hemodialysis Devices Labeled For 'Single Use Only'," August 6, 1986, p. 6.

[11] Note 7, supra.

[12] Note 7, supra, p. 151.

[13] "Repeated Use of Dialyzers is Safe: Long-Term Observations on Morbidity and Mortality in Patients with End-Stage Renal Disease", by V.E. Pollak, K. Shashi Kant, Sandra L. Parnell, Nathan W. Levin, Nephron, accepted July 2, 1985.

[14] Note 1, supra, p. 55.

[15] Note 1, supra, pp. 47-48.

[16] Ibid.

[17] Note 1, supra, pp. 67-68.

[18] Note 10, supra.

[19] Note 1, supra, pp. 56-57.

[20] "Investigation of the Risks and Hazards Associated with Hemodialysis Devices", Minneapolis Medical Research Foundation, Inc., Minn., Prepared for the FDA, June 1980.

[21] Note 1, supra.

[22] Aging Committee staff audit of FDA documents on August 29, 1986.

[23] Note 1, supra, pp. 54-55.

[24] Hakim RM, Fearon DT, Lazarus JM, Biocompatibility of Dialysis Membranes: Effect of Chronic Complement Activation. Kidney International 1984, 26:194-200.

[25] Hakim RM, Breillatt J, Lazarus JM, et al. Complement Activation and Hypersensitivity Reactions to Dialysis Membranes. New England Journal of Medicine 1984, 311(14):878-82

[26] Villaroel F, Ciarkowski AA. A Survey on Hypersensitivity Reactions in Hemodialysis. Artificial Organs 1985, 9(3):231-38.

[27] Ibid.

NOTES TO SECTION VI.

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[1] "Multiple Use of Hemodialyzers", (U.S.) National Nephrology Foundation, Inc., New York, prepared for National Institute of Arthritis, Diabetes, and Digestive and Kidney Diseases, National Institutes of Health, Bethesda, Md., June 30, 1986.

[2] April 15, 1981 letter to Dr. Seymour Perry, Director, National Center for Health Care Technology, PHS, from Robert Wineman, Ph.D., Program Director, Chronic Renal Disease Program, NIADDKD, NIH, PHS. This letter states:

> "The NIH study has been confined to being a laboratory feasibility study to demonstrate that a reprocessed dialyzer has performance characteristics which are essentially in the same range as a new dialyzer. The NIH study did not undertake a longer term examination of any clinical factors including adverse patient responses during therapy nor any measures of immunological response."

[3] Ibid. A conclusion on page 8 of this report states:

> "Utilization of the specified procedures with suitable process and quality control will result in a reprocessed hollow fiber hemodialyzer equivalent in terms of function, cleanliness and sterility to a new hollow fiber hemodialyzer."

[4] October 9, 1981 letter to Norman Deane, M.D., National Nephrology Foundation, Inc., and principal author of "Multiple Use of Hemodialyzers" (June 1981), from John M. Ketteringham, Ph.D., Vice President, Author D. Little, Inc., the firm that conducted the limited study, "The In-Vitro Evaluation Of Certain Issues Related To The Multiple Use Of Hemodialyzers" (February 1981); also, Enrique D. Carter, M.D., Director of the Office of Health Technology Assessment, National Center for Health Services Research and Health Care Technology Assessment, testified in sworn deposition on September 12, 1986, that Dr. Deane, principal author of "Multiple Use of Hemodialyzers", was unable to refute the criticisms of Arthur D. Little, Inc. regarding interpretation of the firm's research data pertaining to the effects of reuse on the hollow-fiber dialyzer.

[5] October 7, 1981 Memorandum to William Ketterer, General Counsel, DHHS, from Harvard Gregory, Contracting Officer, NIADDK, NIH, PHS.

[6] "End Stage Renal Disease (ESRD) Payment Rate Calculaton," OMB budget "passback document" for HCFA, January 1986.

[7] Ibid.

[8] July 31, 1981 Memorandum to Carolyne Davis, Administrator of HCFA, from Edward Kelly, Acting Director, Office of Special Programs, HCFA.

[9] February 18, 1986 Memorandum to the Secretary of DHHS from James Donovan, M.D., Chairman, ESRD Strategic Work Group, DHHS.

[10] October 22, 1982 letter to Robert Rosen, Dialysis Patient, Pennsylvania, from Fernando Villarroel, Ph.D., Director of the Gastroenterology-Urology and General Use Devices, Office of Medical Devices, CDRH, FDA.

[11] December 7, 1982 letter to James Rhoades, Pennsylvania State Senate, from John Villforth, Director, CDRH, FDA.

[12] December 1982 letter to U.S. Representative James Coyne, 8th District, PA, from Carolyne Davis, Administrator, HCFA. This letter cited the 1981 NIH-sponsored report, "Multiple Use of Hemodialyzers," as having established the safety of reuse.

[13] January 6, 1983 letter to U.S. Senator Arlen Specter, Pennsylvania, from Larry Oday, Director, Bureau of Program Policy, HCFA. This letter cited the 1981 NIH-sponsored report, "Multiple Use of Hemodialyzers," as having established the safety of reuse.

[14] July 6, 1983 memorandum to the Assistant Director, Education and Communication, CDRH, FDA, PHS, from Mark Barnett, Director, CDRH, FDA, PHS. This memo states:

> "[W]e should proceed to investigate the need for and possibly develop guidelines on reuse procedures.***Guidelines will***provide assurance to patients and organized patient groups that the government has studied the matter and has endorsed certain principles and/or procedures as adequate";

see also an October 5, 1983 memorandum to the Assistant Secretary for Health, DHHS, from Lester Salans, M.D., Director, NIADDKD, NIH, PHS, and chairman of the PHS Coordinating Committee for ESRD, RE: Report of the Committee.

[15] April 20, 1984 letter to R. E. Easterling, M.D., Chairman, AAMI Reuse Subcommittee, from M. S. Favero, Ph.D., CDC.

[16] Ibid.

[17] August 1, 1984 letter to Robert Rosen, Dialysis Patient, Pennsylvania, from John Villforth, Director, CDRH, FDA, PHS. RE: response to Rosen's May 31, 1984 letter addressed to President Reagan and concerning reuse of dialyzers.

[18] October 23, 1984 memorandum to the senior staff, Center for Devices and Radiological Health, FDA, PHS, from William C. Dierksheide, Ph.D., Dialysis Use Committee Chairman, Office of Training and Assistance, CDRH, FDA. RE: Dialysis Use Committee Report.

[19] Ibid.

[20] December 31, 1984 letter to Perry Ecksel, National Kidney Patients Association, Philadelphia, Pa., from Edward Brandt, Jr., M.D., Assistant Secretary for Health, DHHS. RE: Response to Ecksel's October 30, 1984 letter to Secretary Heckler concerning reuse of dialyzers.

[21] March 5, 1985 letters to Carolyne Davis, Administrator, HCFA, and to Frank Young, M.D., Commissioner, FDA, PHS, from Congressman Fortney Stark, Chairman, Subcommittee on Health, House Ways and Means Committee.

[22] April 10, 1985 letter to Congressman Fortney Stark, Chairman, Subcommittee on Health, House Ways and Means Committee, from Carolyne Davis, Administrator, HCFA.

[23] Ibid.

[24] April 8, 1985 letter to Elizabeth Bridgman, Manager, Technical Development, AAMI, from Martin Favero, M.D., Hospital Inspections Program, CDC.

[25] December 6, 1985 FDA "Draft Working Paper: Reuse Policy Considerations", addressed to the Director, Office of Training and

Assistance, CDRH, FDA, from Lawrence Kobren, Chairperson, Reuse Committee, CDRH, FDA. This draft paper states:

> "Evidence of substantial or unreasonable risks of injury due to improper reprocessing in these facilities brought to the attention of the FDA should be reviewed to determine if the untoward effects were caused by user error (improper reprocessing), or resulted from a reprocessor who attempted to reprocess a device whose design is such that it precludes reprocessing."

[26] July 3, 1985 letter to Perry Ecksel, National Kidney Patients Association, Philadelphia, PA, from Robert Wren, Director, Office of Coverage Policy, Bureau of Eligibility, Reimbursement and Coverage, HCFA; also, a December 4, 1985 letter to Perry Ecksel, National Kidney Patients Association, from Robert Streimer, Acting Director, Bureau of Eligibility, Reimbursement and Coverage, HCFA. RE: Ecksel letters to the Secretary of DHHS. This letter states:

> "While the general question of reuse is a medical practice issue and one which should be decided by the patient's physician, much data has been published which supports the safety and efficacy of reuse."

[27] "Disposable Dialysis Devices: Is Reuse Abuse?", Hearing before the Special Committee on Aging, U.S. Senate, 99th Congress, Second Session, Washington, D.C., March 6, 1986, Serial No. 99-16, p. 66.

[28] July 8, 1986 memorandum to the Assistant Secretary for Health, DHHS, from John Marshall, Ph.D., Director, NCHSR/HCTA, PHS. RE: Hemodialyzer Reuse; see also, Transcript of Proceedings, United States Senate Special Committee on Aging, Deposition of John E. Marshall, Ph.D., Washington, D.C., September 11, 1986.

[29] "Disposable Dialysis Devices: Is Reuse Abuse?", Hearing before the Special Committee on Aging, U.S. Senate, 99th Congress, Second Session, Washington, D.C., March 6, 1986, Serial No. 99-16, pp. 71-72.

[30] February 24, 1986 "Working Paper: Policy Considerations For The Reprocessing Of Devices," by the Reuse Committee, Center for Devices and Radiological Health, FDA, p. 1.

[31] April 16, 1986 memorandum to the Secretary, DHHS, from Acting Assistant Secretary for Health. RE: Heinz letter on hemodialysis.

[32] Ibid.

[33] April 21, 1986 memorandum to the Secretary from Anna Boyd, Policy Coordinator/Health, Executive Secretariat, Office of the Secretary.

[34] April 29, 1986 letter to John Heinz, Chairman, Special Committee on Aging, U.S. Senate, from Otis R. Bowen, M.D., Secretary, DHHS.

[35] Transcript Of Proceedings, U.S. Senate Special Committee on Aging, Deposition of John J. Murphy, M.D., Washington, D.C., September 8, 1986, pp. 84-96.

[36] Ibid.

[37] June 23, 1986 draft MMWR article, "Bacteremia Associated with Reuse of Disposable Hemodialyzers," p. 3.

[38] Note 29, supra.

[39] Note 31, supra.

[40] June 25, 1986 note to FDA Commissioner Frank Young from James S. Benson, Deputy Director of CDRH, FDA, PHS. RE: CDC's MMWR article on infection outbreaks.

[41] Transcript Of Proceedings, U.S. Senate Special Committee on Aging, Deposition of James S. Benson, Washington, D.C., September 3, 1986, p. 137.

[42] July 8, 1986 memorandum to James Hughes, M.D., Director, Hospital Infections Program, CDC, from John J. Murphy, M.D., EIS Officer, Epidemiology Branch, Hospital Infections Program, CDC, and Steven L. Solomon, M.D., Assistant Chief, Epidemiology Branch, Hospital Infections Program, CDC; also, Transcript Of Proceedings, U.S. Senate Special Committee on Aging, Deposition of John J. Murphy, M.D., Washington, D.C., September 8, 1986.

[43] Note 28, supra.

[44] Steven Grossman, Deputy Assistant Secretary for Health Planning and Evaluation, U.S. Public Health Service, DHHS.

[45] Transcript of Proceeding, U.S. Senate Special Committee on Aging, Deposition of John E. Marshall, Ph.D., Washington, D.C., September 11, 1986, p. 176.

[46] Transcript Of Proceedings, U.S. Senate Special Committee on Aging, Deposition of Enrique D. Carter, M.D., Washington, D.C., September 12, 1986, pp. 105-106.

[47] Note 45, supra.

[48] Note 46, supra.

[49] August 11, 1986 memorandum to Administrator, HCFA, from Assistant Secretary for Health. RE: Reuse of Hemodialyzer Devices Labelled for "Single Use Only".

[50] Note 46, supra.

[51] Note 49, supra.

[52] Note 46, supra.

NOTES TO SECTION VII.

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[1] March 5, 1986 memorandum to John Marshall, Ph.D., Director, National Center for Health Services research and Health Care Technology Assessment (NCHSR/HCTA), PHS, from Donald Ian MacDonald, M.D., Acting Assistant Secretary for Health, PHS. RE: Reuse of Dialysis Supplies. This memo states:

> "Current practice for the use of dialysis supplies, especially the filter, varies among dialysis centers. While the FDA has approved the filter as both safe and efficacious for one use, its reuse has never been formally assessed in the PHS. Further, the cost implications of the variance are of interest to HCFA and the Congress, as well as the PHS. There is a need to assess the clinical and cost trade-offs between single and multiple use of dialysis filters. The importance of this issue dictates a timely analysis. Please complete a review and provide me with your conclusions with respect to the safety, efficacy, and cost-effectiveness of dialyzer reuse within 60 days. If this timetable is not feasible, please provide me with an alternative schedule." (signed) Donald Ian McDonald, M.D.

[2] March 7,1986 "CONFIDENTIAL" note to Dr. MacDonald, Acting Assistant Secretary for Health, PHS, from John E. Marshall, Ph.D., Director, NCHSR/HCTA, PHS. RE: Dialyzer Reuse.

[3] Martin Erlichman, a Health Sciences Analyst for the NCHSR/HCTA's Office of Health Technology Assessment, and Enrique Carter, M.D., Director of OHTA, were the only two staff persons to work on the assessment.

[4] August 14, 1986 conversation between Jim Michie of the Aging Committee staff and Martin Erlichman, Health Sciences Analyst, NCHSR/HCTA.

[5] "Assessment of Medical Technology: Reuse of Hemodialysis Devices Labeled For 'Single Use Only'", Fed. Register, Vol. 51, No. 69, April 10, 1986, pp. 12397-12398.

[6] Transcript Of Proceeding, U.S. Senate Special Committee On Aging, Deposition of Enrique D. Carter, M.D., Washington, D.C., September 12, 1986, p. 83.

[7] July 10, 1986 note to Bob Rickard, Executive Secretariat, PHS, from Anne Desmond, Executive Secretariat, PHS. RE: Hemodialysis; also, Transcript Of Proceedings, U.S. Senate Special Committee on Aging, Deposition of John E. Marshall, Ph.D., Washington, D.C., September 11, 1986, p. 86;. also, Transcript Of Proceedings, U.S. Senate Special Committee on Aging, Deposition of Martin Erlichman, Washington, D.C., September 10, 1986, pp. 162-165.

[8] "Briefing On The Reuse Of Hemodialysis Systems, Prepared for: Commissioner of Food and Drugs, by Larry Kobren, Division of Technical Development, Office of Training and Assistance, Center for Devices and Radiological Health, FDA, and Fernando Villarroel, Ph.D., Division of Gastroenterology/Urology and General Use Devices, Office of Device Evaluation, Center for Devices and Radiological Health, FDA, February 27, 1986.

[9] Association for the Advancement of Medical Instrumentation (AAMI) Recommended Practice for Reuse of Hemodialyzers, July 28, 1986.

[10] October 23, 1984 memorandum to Senior Staff, CDRH, FDA, from William Dierksheide, Ph.D., CDRH, FDA. RE: Dialysis Use Committee Report.

[11] These materials include, but are not limited to, documents described in the "Chronology of Major Events" attached to this report and dated 11/17/83, 1/9/84, 10/4/84, 7/23/85, 8/12/85, 9/25/85, 12/13/85, 12/13/85, and 1/31/86; also, "Working Paper: Policy Considerations For The Reprocessing Of Devices" by the FDA's Reuse Committee, February 24, 1986.

[12] October 9, 1986 letter to Norman Deane, M.D., National Nephrology Foundation, Inc. (NNF), from John Ketteringham, Vice President, Arthur D. Little, Inc. RE: Contract No. NO1-AM-9-2214.

[13] Transcript Of Proceeding, U.S. Senate Special Committee on Aging, Deposition of Enrique D. Carter, M.D., Washington, D.C., September 12, 1986.

[14] April 9, 1986 letters to FDA, CDC and NIH requesting comments and information for use in the NCHSR/HCTA's health technology assessment of the safety and efficacy of reusing disposable dialysis devices.

[15] April 3, 1986 Medical Device Report received by FDA. RE: bacteremia outbreak at Daytona Beach, FL, dialysis clinic; also, April 16, 1986 letter to FDA from Alcide Corp. RE: reported adverse reactions suffered by 7 patients at a dialysis clinic; also, May 8, 1986 log entry by Steven Solomon, M.D., Epidemiologist, Hospital Infections Program, CDC. RE: infection outbreak at Los Angeles dialysis clinic.

[16] Transcript of Proceedings, U.S. Senate Special Committee on Aging, Deposition of Enrique D. Carter, M.D., Washington, D.C., September 12, 1986, p. 69.

[17] May 28, 1986 memorandum to Enrique D. Carter, M.D., Director, Office of Health Technology Assessment, NCHSR/HCTA, PHS, from Robert Veiga, M.D., Director, Medical Staff, Office of Health Affairs, FDA. RE: Reuse of Hemodialyzer devices.

[18] Note 16, supra, pp. 72-73.

[19] June 10, 1986 log entry of Steven Solomon, M.D., Epidemiologist, Hospital Infections Program, CDC, PHS. RE: plans for a CDC Morbidity and Mortality Weekly Report (MMWR) article on infections outbreaks at dialysis clinics in Texas, California and Florida; see also, a similar log entry by Dr. Solomon dated June 12, 1986.

[20] June 20, 1986 letter to Enrique D. Carter, Director, Office of Health Technology Assessments, NCHSR/HCTA, PHS, from Gary Noble, M.D., Assistant Director for Science, CDC, PHS.

[21] June 25, 1986 memorandum to the Director, NCHSR/HCTA, PHS, from James S. Benson, Deputy Director, Center for Devices and Radiological Health, FDA, PHS; also, Transcript of Proceeding, U.S. Senate Special Committee on Aging, Deposition of Enrique D. Carter, M.D., Washington, D.C., September 12, 1986, p. 76.

[22] Note 16, supra; see also July 8, 1986 memorandum to Robert Windom, M.D., Assistant Secretary for Health, PHS, DHHS, from John Marshall, Ph.D., Director, NCHSR/HCTA, PHS. RE: Hemodialyser Reuse; also, July 25, 1986 note to Frank Young, M.D., Commissioner of FDA, PHS, from John Marshall, Ph.D., Director, NCHSR/HCTA, PHS. RE: FDA's failure to provide certain documents and information pertinent to the NCHSR/HCTA assessment of reuse.

[23] August 14, 1986 Aging Committee staff audit of documents and records received by NCHSR/HCTA from FDA and CDC on August 11, 1986.

[24] August 2, 1986 letter to John Marshall, Ph.D., Director, NCHSR/HCTA, PHS, from James F. Michie, Chief Investigator, U.S. Senate Special Committee on Aging. RE: transmittal of internal DHHS documents (18 enclosures).

[25] Transcript Of Proceeding, U.S. Senate Special Committee on Aging, Deposition of John E. Marshall, Ph.D., Washington, D.C., September 11, 1986, pp. 15-16.

[26] Transcript Of Proceeding, U.S. Senate Special Committee on Aging, Deposition of Martin N. Erlichman, Washington, D.C., September 10, 1986, p. 52.

[27] Transcript Of Proceeding, U.S. Senate Special Committee on Aging, Deposition of Enrique D. Carter, M.D., Washington, D.C., September 12, 1986, pp. 39-41.

[28] Note 25, supra, pp. 17-18.

[29] Notes 25 and 28, supra.

[30] Note 25, supra, pp. 25-26; also, June 9, 1986 letter to John E. Marshall, Director, NCHSR/HCTA, PHS, from John Heinz, Chairman, Special Committee on Aging, U.S. Senate.

[31] "Assessment of Medical Technology: Reuse of Hemodialysis Devices Labeled For 'Single Use Only'," Federal Register, Vol. 51, No. 69, April 10, 1986.

[32] Note 25, supra, p. 26.

[33] Ibid.

[34] Note 27, supra, pp. 85-92.

[35] Ibid.

[36] August 6, 1986 memorandum to Robert Windom, M.D., Assistant Secretary for Health, PHS, from John E. Marshall, Ph.D., Director, NCHSR/HCTA, PHS. RE: Hemodialyzer Reuse.

[37] August 11, 1986 memorandum to William Roper, M.D., Administrator of HCFA, from Robert Windom, M.D., Assistant Secretary for Health, PHS. RE: Hemodialyzer Reuse.

[38] Note 25, supra, pp. 112-113.

[39] March 5, 1986 memorandum to John Marshall, Director, NCHSR/HCTA, PHS, from Donald Ian McDonald, M.D., Acting Assistant Secretary for Health, PHS. RE: Reuse of Dialysis Supplies.

[40] Ibid.

[41] Ibid.

[42] "Disposable Dialysis Devices: Is Reuse Abuse?", Hearing before the Special Committee on Aging, U.S. Senate, 99th Congress, Second Session, Washington, D.C., March 6, 1986, Serial No. 99-16, pp. 74-77.

[43] Ibid.

[44] Ibid.

[45] June 10, 1986 memorandum to the Donald Newman, Under Secretary, DHHS, from Donald Ian MacDonald, M.D., Acting Assistant Secretary for Health, PHS. RE: Reuse of Hemodialysis Devices.

[46] Ibid.; also, this memorandum further stated: "The recommendations to HCFA will be that FDA should continue to participate in the development of voluntary standards for reprocessing and reuse and that HCFA should include an instruction to address these standards when the State-based survey organizations review individual dialysis facilities. The literature does not suggest the need for clinical trials."

[47] June 10, 1986 memorandum to Donald Newman, Under Secretary, DHHS, from Donald Ian MacDonald, Acting Assistant Secretary for Health, PHS, DHHS. RE: Reuse of Hemodialysis Devices. This memo contains a note indicating that it was prepared by John Marshall, Ph.D., Director, NCHSR/HCTA, PHS. Dr. Marshall acknowledged in sworn deposition on September 11, 1986 that he had drafted this memo.

[48] July 8, 1986 memorandum to Robert Windom, M.D., Assistant Secretary for Health, PHS, from John Marshall, Ph.D, Director, NCHSR/HCTA, PHS. RE: Hemodialyzer Reuse.

[49] Note 25, supra, pp. 165-166.

[50] July 10, 1986 note to Bob Rickard, Office of the Assistant Secretary for Health, PHS, DHHS, from Anne Desmond, Office of the Assistant Secretary for Health, PHS, DHHS. RE: Hemodialysis. This note further stated:

> "Anna [Boyd] had heard about some problems with disinfectants used in dialyzer reprocessing, and about the disagreement between NCHSR and CDC on whether more study is needed on the microbiololgic quality of reprocessed filters. She asked us to call her with more information on that, for her edification."

[51] Note 25, supra, p. 71

[52] Note 49, supra.

[53] Note 25, supra, pp. 72-74.

[54] Ibid.

[55] Note 25, supra, p. 68.

[56] Note 25, supra, p.69.

[57] August 6, 1986 memorandum to Robert Windom, M.D., Assistant Secretary for Health, PHS, DHHS, from John Marshall, Ph.D., Director, NCHSR/HCTA, PHS. RE: Hemodialyzer Reuse.

[58] August 11, 1986 memorandum to William Roper, M.D., Administrator of HCFA, from Robert Windom, M.D., Assistant Secretary for Health, PHS. RE: Reuse of Hemodialyzer Devices Labelled for "Single Use Only".

[59] Ibid.

[60] Ibid.

[61] Ibid.

[62] Ibid. The "control" copy of this August 11 memo listed John Marshall, Director, NCHSR, PHS, as having prepared the memo. Other individuals listed as having revised the memo are: J. Dickson, Office of the Assistant Secretary for Health, PHS; Bruce Artim, Office of the Assistant Secretary for Health; James Mason, Director, CDC, PHS; Renault, CDC, PHS; Hardy, CDC; John Villforth, Director, Center for Devices and Radiological Health (CDRH), FDA, PHS; Robert Eccleston, CDRH, FDA; Richard Riseberg, Chief Counsel, PHS; and PHS Agency Heads.

[63] Note 27, supra.

[64] Note 25, supra, pp. 103-104.

[65] Note 25, supra, p. 92

[66] Note 25, supra, pp. 88-94; Note 26, supra, pp. 135-141; and note 27, supra, pp. 93-100.

[67] Note 26, supra, p. 141.

[68] Note 27, supra, pp. 93-100.

[69] Note 25, supra, p. 113.

[70] Transcript Of Proceeding, U.S. Senate Special Committee on Aging, Deposition of John C. Villforth, Washington, D.C., September 4, 1986, pp. 119-120.

APPENDIX I.

REUSE OF HEMODIALYSIS DEVICES: CHRONOLOGY OF MAJOR EVENTS

Prepared By Staff

of the

Special Committee on Aging, U.S. Senate

1898 Dr. Hansen, a scientist, produced liver damage (hepatoxicity) in cats by injecting 4% formalin (formaldehyde) into the gall bladder of cats. [NOTE: FORMALDEHYDE IS THE CHEMICAL MOST OFTEN USED AS THE "DISINFECTANT" IN THE REPROCESSING OF DIALYSIS DEVICES, DIALYZERS, BLOOD LINES, ETC.]

1905 Dr. Fischer, a scientist, conducted the first "systematic studies of the hepatotoxicity" (liver damage causing) of formaldehyde and confirmed the findings of Dr. Hansen (see above) and earlier findings of others. [NOTE: A NUMBER OF OTHER TOXICITIES ASSOCIATED WITH FORMALDEHYDE HAVE BEEN IDENTIFIED SINCE THE TURN OF THE CENTURY; THEY INCLUDE, BUT ARE NOT LIMITED TO, CANCER-CAUSING, KIDNEY DAMAGE-CAUSING, ASTHMA-CAUSING, TERATOGENIC (BIRTH DEFECTS), INTERFERENCE WITH REPRODUCTIVE ACTIVITIES, INTERFERENCE WITH THE CENTRAL NERVOUS SYSTEM AND DAMAGE TO BLOOD (IMMUNOLOGICAL).]

10/30/72 P.L. 92-603 established Medicare funding of dialysis under the End Stage Renal Disease Program (ESRD).

11/11/77 FDA Compliance Policy Guide 7124.23, Chapter 24 - Devices. SUBJECT: Reuse of Medical Disposable Devices. ". .[T]here is a lack of data to support the general reuse of disposable medical devices *** [T]he institution or practitioner who reuses *** should be able to demonstrate: (1) that the device can be adequately cleaned and sterilized, (2) that the *** quality of the device will not be adversely affected, and (3) that the device remains safe and effective for its intended use.***FDA considers disposable devices which are being reused, and which have not been demonstrated to be capable of complying with the requirements in the above [sentence], to be adulterated *** and in violation of 21 U.S.C. 331(k). [SEE FDA'S REVISED 7/1/81 COMPLIANCE POLICY GUIDE BELOW.]

6/13/78 P.L. 95-292: "Special Provisions Relating To Coverage Under Medicare Program for [ESRD]." This law mandated a study by NIH of reuse of dialyzers to determine safety. [SEE 10/17/78 ENTRY BELOW.]

10/17/78 Research Concept Clearance. Project Title: Study of Dialyzer Reuse. Project Officer: Robt. Wineman, Ph.D. "Factors to be evaluated will include evaluation of multiple resterilization *** procedures, bacteriological and virological safety and patient response factors especially, immunologic and antigenic.***Reuse of [dialyzers] has been a topic of interest and concern [for] over fifteen years.***Because of the potential cost savings with reuse, Congress recently passed Public Law 95-292 which requires "The Secretary shall conduct a study of the medical appropriateness and safety of cleaning and reusing dialysis filters by home dialysis patients.***A coordinated plan for determining the medical appropriateness and safety of reuse is under development by NIH, FDA and CDC. If reuse is considered appropriate, changes in dialyzer

	labeling will be required (FDA) and possibly changes in ESRD regulations under Medicare (HCFA).
10/20/78	Memo to Administrator, HCFA, from Asst. Secretary for Health and Surgeon General. RE: Coordination of a Work Plan for Studies on End-Stage Renal Disease (ESRD) - INFORMATION. ". . [S]tudies listed in P.L. 95-292 for ESRD should be started or evaluated quickly.*** The Public Health Service (PHS) expects to be reimbursed by HCFA for all research performed by PHS in this regard.*** PHS concurred with projected funding estimates developed by the FDA and NIH. ."
1/15/79	Memo to Asst. Secretary for Health and Surgeon General from Administrator, HCFA. RE: Coordination of Experiments and Studies on ESRD Authorized by P.L. 95-292; Your memo of Oct. 20. ". . [W]e expect that the costs of administering and evaluating the studies and experiments will be funded by the respective agencies with lead responsibility, as outlined in our memo of Sept. 8. HCFA is planning to request a supplemental appropriation to cover the necessary costs of carrying out studies and experiments [other than dialyzer reuse].*** We expect the [PHS] to arrange for obtaining funds to conduct studies of *** the medical appropriateness of dialyzer reuse.***"
5/20/79	"DIALYZER REUSE: NAPHT's Statement of Position" position paper adopted by the Board of Directors of the National Association of Patients on Hemodialysis and Transplantation, Inc. "NAPHT is opposed to the reuse of disposable hemodialysis filters at the present time except in carefully planned and controlled experimental situations where patients elect to participate in the study.***The patient being asked to reuse dialyzers should be informed of the possible side effects, of expected number of uses, and of the methods and controls on reprocessing.***Until such time as dializer reuse is proven to be safe and effective (by careful scientific study as well as by clinical observation), NAPHT is opposed to this practice."
6/80	"Investigation of The Risks And Hazards Associated with Hemodialysis Devices" report, prepared for FDA, Bureau of Medical Devices (Kobren et al.), by the Regional Kidney Disease Program, Minneapolis Medical Research Foundation. This study had two goals: ". . to provide [FDA] with the information required for writing and implementing standards; [and] to provide *** additional data [for] evaluation of system component devices.***The study's scope was restricted to device performance relative to patient safety.***The principal justification for reusing dialyzers is an economic one.***The safety and efficacy of reuse is a subject of some controversy. [S]ome reports *** document the adverse effects of reuse, [but] others *** indicate that dialyzer reuse is safe and effective *** with minimal patient complications.***[The Health Industry Manufacturers' Association (HIMA)] appropriately points out that *** the practice of reuse is largely unregulated and therefore does constitute a potential threat to patient safety.***The issue to be resolved *** is whether standards, either performance or disclosure, can be written for the reuse of dialyzers. At the present time, such standards cannot be proposed for two reasons: First, in the absence of definitive studies, such as the one contemplated by the NIH, the necessary criteria to establish standards cannot be formulated. Second, at the present time, manufacturers label dialyzers *** for single use only. Unless these issues are resolved, standards related to reuse are not relevant. ."

1/5/81	Memo to Assistant Secretary for Health (ASH), DHHS, from Jere Goyan, M.D., FDA Commissioner. RE: reuse of dialyzers--a response to 11/18/80 ASH inquiry about reuse. ". . The guide [compliance policy guide?] is intended to address responsibility for reuse *** when such action is clearly contrary to the mfgr's labeling.***When an institution *** chooses to reuse *** the responsibility ***shifts from the mfgr. to the party responsible for the reuse.***The enclosed document, 'Reuse of Disposable Hemodialyzers', prepared in April 1979, still represents FDA's opinion--that is, that FDA cannot at this time recommend the reuse of [dialyzers].***The studies *** under way at the [NIH] will *** be concluded in December 1980. These may affect *** reuse; in the event that the NIH studies change our current position, we will advise you. In any case we do not believe there would be any significant change in FDA's position on the question of responsibility under the FD & C Act."
1/7/81	Lttr. to E. L. Kelly, Acting Dir., Office of Special Programs, HCFA, from Nancy B. Cummings, M.D., Assoc. Dir., NIAMDD, NIH, and Robert Wineman, Ph.D., Program Dir., Chronic Renal Disease Program, NIAMDD, NIH. RE: research and/or demonstrations relating to ESRD. ". . In some cases the fundamental research contribution [of these projects] to medical science would be fairly low. With this factor in mind,*** it would be relatively unlikely that NIH would fund some types of research that might have great interest to HCFA because of its economic impact.*** Clinical Trial of Multiple Use of Hemodialyzers***[would have] a significant economic impact but a low contribution to basic medical science. Potential cooperation from HCFA: (a) Full funding of the needed clinical trials***. (b) Supervision of collection of data on cost and material manpower required for multiple use. (c) Contributions tc design of the overall study. ."
1/15/81	Memo to Dr. Nancy Cummings, Dir., NIAMDD, NIH, and James Kaple, Dir. ORDS, HCFA, from Ronald Schwartz, Acting Asst. IG for Health Care and Systems Review. RE: Request for Info on Kidney Dialyzer Reuse Research. "It has come to our attention that [NIAMDD] had discontinued *** research efforts into the efficacy and safety of kidney dialyzer reuse. Under the 1978 Amendments to the [SSA], Congress mandated *** this research *** Now it appears unclear whether [NIH] or [HCFA] is primarily responsible for financing and administering the continuation of dialyzer research beyond Phase I.***Unless HCFA and NIH can *** resolve this issue, we plan to notify the Congress.***We request that a formal, written explanation which outlines your position on this issue be returned to this office [by] January 27, 1981." [SEE 8/17/84 DHHS OIG LTTR BELOW.]
1/28/81	Memo to Acting Asst. IG, Health Care and Systems Review, DHHS, from Nancy Cummings, M.D., Associate Dir., NIAMDD, NIH. ". . No funds were made available for dialyzer reuse studies, nor was responsibility assigned formally to any PHS Agency.***[In] 1979, because no funds were available and because these studies were not deemed to be scientific research, the decision was made to limit an award to a one-year pilot study by contract.***[Dr. James Kaple of HCFA and I] concur that since the issue about dialyzer reuse is one of SAFETY of dialyzer reuse, it would appear to belong more appropriately within FDA's sphere of responsibilities. ."
2/81	Memo to R. D. Schwartz, Acting Asst. IG for Health Care & Systems Review, from James Kaple, Acting Dir., Office of Research, Demonstrations and Statistics, HCFA. RE: Response to Your Request For Information Pertaining to

Kidney Dialyzer Reuse. ". . P.L. 95-292 mandated *** a study on the medical appropriateness and safety of cleaning and reusing dialysis filters by home dialysis patients.*** The Department divided responsibility *** between HCFA and PHS.*** PHS indicated [see 10/20/78 memo above] that they expected to be reimbursed by HCFA for all research pertaining to their responsibilities under the legislation. HCFA responded to PHS [see 1/15/79 memo above] that we expected PHS 'to arrange for obtaining funds to conduct studies'***. PHS did not respond to this memorandum***."

4/2/81 Memo to Ronald Schwartz, Acting Asst. IG for Health Care & Systems Review, DHHS, from Acting Dir., Bureau of Medical Devices, FDA. RE: response to Schwartz 2/25/81 memo (ABOVE) on dialyzer reuse. ". . The FDA disagrees with with Dr. Cummings' (NIH) statement that the responsibility for conducting dialyzer reuse research *** would appear to belong *** within FDA's sphere of responsibilities.***The FDA position on reuse *** is in a January 5, 1981 memo from the Commissioner *** to the Assistant Secretary for Health: 'When an institution or practitioner chooses to reuse a single-use [dialyzer] the responsibility for the safety and effectiveness of the reused device shifts from the manufacturer to the party responsible for the reuse.' A well-designed clinical study addressing the overall safety of reuse versus single-use might be desirable, however, such a study is not within the mission of the FDA. Such research should be performed by agencies equipped and staffed for research activities." [SEE 1/5/81 FDA COMMISSIONER MEMO TO ASH ABOVE.]

4/9/81 Memo to Nancy Cummings, M.D., Dir., Kidney, Urologic and Blood Disease, NIH, from Edward Kelly, Acting Dir., Office of Special Programs, HCFA. RE: multiple use of dialyzers. ". .[A] medical practice *** employed for 20 years *** cannot be considered experimental.***[W]e believe there is sufficient evidence to make a decision that reuse is a generally safe, efficacious, and cost effective procedure when appropriate standards are met for reprocessing *** The single most important issue *** is the *** promulgation of standards including criteria for patient selection.***[S]uch standards would be most effective if they were consensus standards, developed by all involved governmenmt agencies--the NIH, CDC, FDA and HCFA. Therefore, we recommend that you call a meeting upon the receipt of Dr. Deane's study . ." [NOTE: THIS MEMO WAS PREPARED BY HSQ, OSP, OESRD, HCFA; SEE 5/16/81 NIH MEMO BELOW.]

4/15/81 Lttr to Dr. Seymour Perry, Dir., Nat'l Center for Health Care Technology, DHHS, from Robt. Wineman, Ph.D., Program Dir., Chronic Renal Disease Program, NIADDKD, NIH. RE: Comments on the ESRD Program Evaluation Plan. ". . The NIH study has been confined to being a laboratory feasibility study to demonstrate that a reprocessed dialyzer has performance characteristics which are essentially in the same range as a new dialyzer. The NIH study did not undertake a longer term examination of any clinial factors including adverse patient responses during therapy nor any measures of immunological response.***In the NIH study, the attempt was made to show that performance characteristics of reprocessed dialyzers, residual sterilant content, and sterility status are in reasonable ranges to use reprocessing techniques. ." [SEE 1/15/81 DHHS OIG MEMO AND 1/28/81 NIAMDD, NIH, MEMO ABOVE.]

4/23/81 Lttr to Norman Deane, M.D., Nat'l Nephrology Foundation (NNF), from John Ketteringham, Vice President, Arthur D. Little Inc. (ADL) RE: Ketteringham's request to review the report on the NIH funded study prior to publication [ADL

WAS THE SUBCONTRACTOR TO NNF FOR RESEARCH ON REUSE OF DIALYZERS]. "As we agreed, I would appreciate the opportunity to review and contribute to the final version [of the report] before it is published***." [NOTE: SEE 6/30/81, 5/4/81, 10/7/81, 10/9/81 & 3/19/82 ENTRIES BELOW.]

5/4/81 Lttr to John Ketteringham, Arthur D. Little Inc., from Norman Deane, M.D., Nat'l Nephrology Foundation, Manhattan Kidney Center. "Your letter [of 4/23/81] suggests a misunderstanding since I did not agree *** to give you review prerogatives on the final report [concerning reuse of dialyzers]***." [NOTE: SEE 4/23/81 ENTRY ABOVE, AND 6/30/81, 10/7/81, 10/9/81 & 3/19/82 ENTRIES BELOW.]

5/6/81 Memo to Edward Kelly, Acting Dir., Office of Special Programs, HCFA, from Nancy Cummings, M.D., Associate Dir., KUBD/NIADDK, NIH. RE: reuse of dialyzers--response to Kelly's 4/9/81 memo. "[We] support in principle *** the utility of planning a meeting to discuss dialyzer reuse. However, there are two facets to the issue which you raise about development of reprocessing standards. The most important one, which could be a very controversial and volatile one, is that dialyzer reprocessing is considered by us and by practicing nephrologists to be a component of medical practice. It would be advisable that suggested guidelines be developed by a nongovernmental 'neutral' group *** The acceptance of the nephrology community would be obtained more readily if this route were followed. We cannot emphasize too strongly the importance of the government not dictating a mode of practice. ."

5/21/81 Memo to Stuart Nightingale, M.D., Acting Associate Commissioner for Health Affairs, FDA, from F. Villarroel, Dir., Div. of Gastroenterology-Urology and General Use Devices, Bureau of Medical Devices, FDA. RE: reuse of dialyzers. "At the April 13 meeting *** the Gastroenterology-Urology Panel Section strongly and unanimously recommended to [FDA] to request a Consensus Development Conference on reuse.***Reuse is a controversial practice *** The Panel members were aware of Congressional interest in reuse, and that the only Government effort toward resolving this issue is being terminated this year (see attachment).***Since reuse *** is *** of significant importance for the Government, physicians, and patients, I endorse the Panel recommendation . ."

6/30/81 "MULTIPLE USE OF HEMODIALYZERS" report by Manhattan Kidney Center/National Nephrology Foundation [NORMAN DEANE, M.D., PRINCIPAL AUTHOR] under contract to the National Institute of Arthritis, Diabetes and Digestive and Kidney Diseases, NIH (mandated by Congress in 1978). [NOTE: REPORT CONCLUSIONS ARE CONFUSING AND CONTRADICTORY; AND THE CONGRESSIONALLY MANDATED STUDY ON WHICH THIS REPORT WAS TO HAVE BEEN BASED WAS DEFUNDED AND NEVER COMPLETED] ". . Studies performed in this project support the conclusion that the *** experience with formaldehyde as an antimicrobial for sterilization of [dialyzers] warrants the recommendation of continuation of its use.***The recommended concentration is 2.0% formaldehyde.*** Utilization of the specified procedures with suitable process and quality control will result in a reprocessed [dialyzer] equivalent in terms of function, cleanliness and sterility to a new hollow fiber [dialyzer].***[C]linical experience does not provide information which could appropriately lead to a standardized protocol for reprocessing dialyzers with suitable quality control and process control. The technical experience *** does not provide a suitable data base for critical analysis of the parameters of importance for reprocessing of dialyzers. A definition of conditions to effect satisfactory rinsing, cleaning, sterilization and preparation for use of a reprocessed dialyzer is necessary. ." [NOTE: THE AAMI COMMITTEE DECIDED NOT TO INCLUDE RECOMMENDED PRACTICE FOR BLOOD LINES AND PATIENT INFORMED CONSENT AND FREEDOM OF CHOICE; CONSULTANT ARTHUR D. LITTLE, INC. (ADL), WAS HIGHLY CRITICAL OF THIS REPORT IN 10/9/81 LTTR BELOW; THIS REPORT WAS REISSUED IN 2/82 WITHOUT ANY OF THE CHANGES URGED BY ADL.]

7/1/81 FDA Compliance Policy Guide 7124.16, Chapter 24 - Devices. SUBJECT: Reuse of Medical Disposable Devices. [NOTE: THIS REVISION IS IDENTICAL TO THE 11/11/77 GUIDE ABOVE, BUT DELETES THE POLICY FINDING OF ADULTERATED, AND RESULTING VIOLATION OF 21 U.S.C. 331(k).] ". . The reuse of disposable devices represents a practice which could affect both the safety and effectiveness of the device. Information developed regarding this practice should be referred to the Bureau of Medical Devices for review and evaluation."

7/31/81 Memo to Carolyn Davis, Administrator, HCFA, from Edward Kelly, Acting Dir., Office of Special Programs, HCFA. RE: dialyzer reuse. "Per your recent request, information on the potential savings, incidence and safety issues of dialyzer reuse *** If reuse, as currently practiced, was extended to 100% of facilities *** the potential savings could be as high as $150 to $200 million.***Numerous risks to patient safety have been attributed both to reuse and first use of dialyzers: (1) Infection Risk; (2) Formaldehyde induced antibodies *** which can result in increased risks of transplant rejection; (3) Pyrogenic Reactions *** reports of fever and chills; (4) Decreased dialyzer performance *** most facilities which reuse report no meaningful reduction.***While more controlled, scientific studies of these safety issues are needed, it is clear *** that there is little documented evidence of a safety risk associated with dialyzer reuse.***[The NIH] has released a final report on a laboratory study of dialyzer reuse [which] provides considerable scientific data in support of reuse. ." [SEE 8/11/81 HCFA NOTE BELOW; ALSO, SEE 10/9/81 ADL LTTR BELOW.]

8/11/81 Note to Drs. Rubin and Brandt, ASH, DHHS, from Carolyn Davis, Administrator, HCFA. RE: dialyzer reuse. "The attached memorandum related to dialyzer reuse is but one of a number of initiatives I believe we need to take in order to contain the costs of ESRD . ." [SEE 7/31/81 MEMO ABOVE.]

8/25/81 Memo to Assoc. Dir. for Device Evaluation, FDA, from Ann Holt, Assoc. Dir. for Compliance, Bureau of Devices, FDA. RE: Compliance Policy Guide 7124.16. ". . This is in response to Dr. Villaroel's memo of 8/10/81 questioning the policy section of the above referenced CPG. In late 1979, this Bureau undertook a review of all outstanding CPGs as part of FDA's effort to combine its Administrative Guides with the CPGs.***[CPG 7124.16] began the sign off process unchanged from the previous wording, however, Dr. Carl Bruch (HFK-400), then acting ADDE, objected to the wording that the device would be considered to be 'adulterated' [and] Dr. Bruch proposed the present wording.***It was not until 7/1/81, however, that the revised CPG appeared in the manual. DCO does not consider the change to be *** significant."

10/7/81 Memo to William Ketterer, DHHS General Counsel, from Harvard Gregory, Contracting Officer, NIADDK, NIH. RE: Telephone Conversation Re: Nat'l Nephrology Foundation Contract [WITH SUBCONTRACTOR ARTHUR D. LITTLE INC. (ADL)]. The question was posed as to whether a final report submitted by a subcontractor [ADL] to a contractor [Nat'l

Nephrology Foundation (NNF)] *** could be disclosed upon request to a third party, or simply made public by the Government in the same manner as the Contractor's final report to the Government under the terms of the contract would be disclosed or made public. Your answer to me was no; that since the subcontract final report was submitted to the contractor, the Government did not have possession of the subcontract report. Therefore the Government could not disclose or make public what it did not possess***." [NOTE: SEE 4/23/81, 5/4/81 AND 6/30/81 ENTRIES ABOVE, AND SEE 10/9/81 AND 3/19/82 ENTRIES BELOW.]

10/9/81 Lttr to Norman Deane, M.D., Nat'l Nephrology Foundation, Inc. (NNF), from John Ketteringham, V.P., Arthur D. Little, Inc. RE: Contract No. NO1-AM-9-2214. "The final report*** 'Multiple Use of Hemodialyzers,' dated June 1981, was prepared by the Manhattan Kidney Center, submitted to the NIAMKDD without benefit of review at Arthur D. Little, Inc. (ADL). The report contained data and text taken from our report to NNF, 'The In-Vitro Evaluation of Certain Issues Related to the Multiple Use of Hemodialyzers,' dated February 1981, prepared under subcontract.***[I]nterpretations and conclusions presented in the final report to NIAMKDD are those of the [NNF] and not of [ADL]. In general.***the report fails to make clear where material referenced to ADL's and other authors' work begins and ends. Also, we urge that conclusions, such as those relating to the concentration of formaldehyde used for sterilization, be substantiated *** by clinical trials, as was envisaged in the original request for proposal *** The final report omits most of the limitations which attended data and statistical statements in the ADL report *** In particular, the final report tacitly asserts that the dialyzers which NNF submitted to ADL for testing were sufficient in number and representation to permit conclusive statistical comparisons. The ADL report makes no such assertion, and in fact advises *** that 'more extensive testing be performed to substantiate' its qualified findings.***[A] number of tables presenting data or statistical conclusions in the NNF report which are attributed to the ADL report *** are not derived from the ADL report."

2/82 "MULTIPLE USE OF HEMODIALYZERS" report by Manhattan Kidney Center/National Nephrology Foundation under NIH contract was reissued without reflecting any of the changes urged by Consultant Arthur D. Little, Inc. (ADL) in a highly critical 10/9/81 letter. [SEE 10/9/81 ADL LTTR ABOVE; ALSO, SEE 6/30/81 ENTRY ON REPORT ABOVE]

2/18/82 Memo to Secretary, DHHS, from James Donovan, M.D., Chairman, ESRD Strategic Work Group (organized by HCFA and included managers from DHHS, HCFA and NIH--22 members in all). RE: "Chairman's Report--INFORMATION". ". . [I]ssues identified were prioritized by the Work Group***[There are] four areas of critical importance***: [1] improve [HCFA's] ESRD data base in order to provide a sound foundation for policy development; [2] ESRD prevention programs; [3] research and evaluation programs for reducing the incidence of ESRD; [4] transplantation, reuse and rehabilitation, [including] a major clinical trial to determine effects of hemodialyzer reuse."*** Background. In 1972 Congress passed PL 92-603 which first authorized funding for the [ESRD] program. In the enacting statute, as well as in subsequent legislation (PL 95-292, 1978), Congress articulated the mission of the ESRD program: to assure patient access to high quality, cost effective medical care.***" [NOTE: THIS MEMO NEVER REACHED THE SECRETARY -- SEE 12/14/82 MEMO BELOW, AND SEE 10/5/83 ENTRY BELOW FOR MEMO AND REPORT TO ASST. SECRETARY FOR HEALTH.]

3/15/82	Lttr to Robert Wineman, M.D., NIH, from John Ketteringham, V. P., Arthur D. Little Inc. RE: "amended version" of the report, "Multiple Use of Hemodialyzers". "I read in the *** 'Gray Sheet' of March 8, 1982 *** that 'an amended version' of the report, 'Multiple Use of Hemodialyzers,' was released at a 'Dialyzer Re-Use Workshop,' on March 1, 1982. As you know, this report contains substantial pieces of work conducted at Arthur D. Little, Inc., and we would appreciate receiving a copy. Does this version address the various comments and corrections made by Arthur D. Little, Inc., to you in our letter of October 9, 1981? Or is our letter to be made available to those persons receiving this report? I note that the 'Gray Sheet' records that 2% formaldehyde is 'recommended' by this report. Our opinion is that the scientific data contained in the original version of the report did not support a recommendation, but merely showed that in specific in vitro conditions, 2% formaldehyde achieved a high kill of certain representative pathogens. We recommend further data be generated before any recommendation is made regarding clinical practice." [NOTE: SEE JUNE 1981 ENTRY ABOVE; ALSO SEE 10/9/81 ENTRY ABOVE.]
3/19/82	Lttr to John Ketteringham, V.P. Arthur D. Little Inc. (ADL), from Robt. Wineman, Ph.D., Program Director, Chronic Renal Disease Program, NIADDKD, NIH. RE: response to Ketteringham's letter of 3/15/82 [SEE ENTRY ABOVE]. "[A] copy of the amended report "Multiple Use of Hemodialyzers" is enclosed. The revision was prepared by Dr. Deane taking into consideration the comments and corrections noted in your letter of October 9 [1981] to Dr. Deane. We have no plans to distribute the [10/9/81 letter of Arthur D. Little, Inc. with the report***." [NOTE: SEE 10/9/81, 10/7/81, 6/30/81, 5/4/81 & 4/23/81 ENTRIES ABOVE.]
APR. 1982	"Between April and November 1982, 27 of 140 patients in a [dialysis] center in Louisiana were infected with rapidly growing mycobacteria.***Of 26 identified isolates, 25 were **Mycobacterium chelonei** ssp. abscessus, and one was an **M. chelonei**-like organism. One factor common to all patients was exposure to processed [dialyzers]. Environmental sampling of the water treatment system showed widespread contamination with nontuberculous mycobacteria *** We hypothesize that patients became infected when their blood circulated through processed dialyzers that contained viable rapidly growing mycobacteria. This outbreak demonstrates that hemodialysis patients may be at risk for developing infections *** that *** may go unrecognized when routine culture methods are used. It also emphasizes the importance of using effective procedures to disinfect dialyzers in [dialysis] centers.*** The processing procedure***included rinsing the dialyzer with water, rinsing and filling with 2% aqueous formaldehyde, storing for 48 hrs, and then rinsing with sterile saline.*** Between June 1982 and June 1983, 14 (51%) of 27 patients with multiple underlying medical problems died***." [NOTE: THE DEATH OF ELAINE SHUMAN IN SEPT. 1983 IS NOT INCLUDED IN THE GROUP OF 14 PATIENTS ABOVE; SEE 6/24/85 CDC REPORT, "INFECTIONS WITH MYCOBACTERIUM CHELONEI IN PATIENTS RECEIVING DIALYSIS AND USING PROCESSED HEMODIALYZERS," PUBLISHED IN NOVEMBER 1985 IN THE JOURNAL OF INFECTIOUS DISEASES, VOL. 152, NO. 5; ALSO, SEE NOVEMBER 1985 ENTRY BELOW.]
7/29/82	Lttr "To Whom It May Concern" (at FDA) from Robt. Rosen, dialysis patient. RE: use of formaldehyde in dialyzer reuse.
9/21/82	Lttr to Robt. Rosen, dialysis patient, from John Newmann, President, (NAPHT) Nat'l Assoc. of Patients on Dialysis and

Transplantation, Inc. Congratulates Rosen "for standing up for your right to informed consent concerning reuse. . NAPHT has been opposed to re-use. ."

10/22/82 Lttr to Robt Rosen, dialysis patient, from F. Villarroel, Ph.D, Dir., Division of Gastroenterology-Urology and General Use Devices, Office of Medical Devices, CDRH, FDA. RE: formaldehyde in dialyzer reuse. "[Y]our doctors have informed you that***you may be getting a [trace amount] of 5 ppm of formaldehyde solution at each dialysis session.*** Most individuals are chronically exposed to formaldehyde, which is a natural product found in many foods and water in trace amounts. In the human body it is rapidly transformed into formic acid, which is in turn transformed into carbon dioxide and water which are normal metabolic products.***Formaldehyde is used as an ingredient in numerous products regulated by the [FDA].***The FDA is unaware of any report of adverse reactions due to the long-term use of dialyzers disinfected with formaledhyde solutions. We trust that this information will help you in making an educated decision on whether or not to allow yourself to be treated with reused dialyzers. ." [SEE FDA LTTRS OF 12/7/82, 3/15/83 & 8/1/84 BELOW.]

12/7/82 Lttr to James Rhoades, Pa. Senate, from John Villforth, Dir., Center for Devices and Radiological Health, FDA. RE: response to Rhoades' 11/1/82 lttr. "Formaldehyde has not been shown to be toxic when ingested or injected in trace amounts.***[M]inute quantities of formaldehyde are used in several vaccines *** (etc.) *** There is no clinical evidence that formaldehyde in concentrations at or below the Kidney Foundation's guideline level are harmful to dialysis patients.***Most manufacturers have chosen to label dialyzers *** 'for one-time use only'. ." [SEE FDA 10/22/82 LTTR ABOVE; ALSO, SEE 8/1/84 FDA LTTR BELOW]

12/?/82 Lttr (undated) to U.S. Rep. James Coyne, 8th Dist. Pa., from Carolyne Davis, Administrator, HCFA. RE: response to Coyne lttr to Sec. Schweiker concerning Robt. Rosen, dialysis patient. "Multiple use of hemodialyzers has been an ongoing practice *** for 20 years.***There is no Medicare policy that requires dialyzer reuse.***In response to *** Congress, [NIH] conducted a study on reuse *** and concluded that [dialyzers] can be reused if they are reprocessed in accordance with certain procedures [SEE 2/82 NIH REPORT ABOVE].***It appears from your inquiry that Mr. Rosen is unclear about [his] right to accept or refuse reused dialyzers. "

12/13/82 Memo to Dr. Brandt, ASH, DHHS, from Dr. Hayes, Commissioner, FDA. RE: FDA's involvement in reuse of dialyzer equipment. ". . The high costs [of dialysis] have prompted examinations of ways to reduce the cost, one being the multiple use of [dialyzers].***FDA is involved in their use and reuse in three ways: Mfgrs. will soon be submitting dialyzer filters labeled for multiple use; FDA has participated in and financially supported workshops for developing guidelines for reprocessing *** In 1978, Congress mandated a study of the medical appropriateness and safety of reusing [dialyzers].***However, no clinical trials to determine the effects of reuse were included in the study.***HCFA has recently convened a *** work group to address the need for clinical studies and has prepared options suggesting ways to improve the ESRD Program's management. Those options included a recommendation that FDA conduct a clinical trial to evaluate *** reuse. Although we concur in the need for an evaluation, this Agency is not staffed and equipped for clinical research. We can, however, recommend protocols for such research and review the data from clinical trials for adequacy. ."

12/14/82	MEMO to the Executive Secretary, DHHS, from Dale Sopper, Asst. Secretary for Management and Budget, DHHS. RE: Report of the Intradepartmental Work Group on ESRD [SEE 2/18/82 ENTRY ABOVE]. "I do not concur with forwarding [the ESRD work group report] to the Secretary.***[T]his paper is incomplete and fails to respond to the Secretary's request of April 1982 for an ESRD options paper.***The Secretary met with Dr. Davis [of HCFA on 4/8/82 to] review the report***[T]he Secretary asked HCFA to submit an abbreviated options paper to him by April 23***In the paper, HCFA was to define resource requirements as well as expected benefits***I am concerned that HCFA appears to have developed its recommendations in the subject issue paper without attention to their potential budgetary impact.***As requested by the Secretary on April 8, HCFA should revise the paper to include these cost estimates as well as the benefits***. [NOTE: SEE THE 2/11/83 AND 10/5/83 ENTRIES BELOW.]
12/14/82	Lttr to Robt. Rosen, dialysis patient, from U.S. Rep. James Coyne. 8th Dist., Pa. RE: HCFA response (SEE 12/13/82 ENTRY ABOVE) to Coyne lttr. "As you can see, according to [NIH], the hemodialyzers can be reused if they are reprocessed in accordance with certain procedures.***It appears that the reuse of dialyzers is still of questionable safety. ."
1/6/83	Lttr to Robt. Rosen, dialysis patient, from Larry Oday, Dir., Bureau of Program Policy, HCFA. RE: response to a Rosen lttr. [NOTE: THIS LTTR IS ALMOST IDENTICAL TO THE UNDATED CAROLYNE DAVIS LTTR TO REP. COYNE ABOVE.]
1/6/83	Lttr to Sen. Specter from Larry Oday, Dir., Bureau of Program Policy, HCFA. RE: Robt Rosen, dialysis patient. [NOTE: THIS LTTR IS IDENTICAL TO ODAY'S 1/6/83 LTTR TO ROSEN ABOVE.]
2/11/83	Memo to Agency Heads, OASH Staff Officers, from Edward Brandt, M.D., Asst. Secretary for Health, DHHS. RE: End-Stage Renal Disease. ". . A departmental task force has made several recommendations for approaching [the ESRD] problem, and the PHS has been assigned responsibility for most of them. I find them to be both reasonable and appropriate. A copy of the report is attached.***I am designating NIH as the lead Agency to provide me with [a coordinated] response. I have asked Dr. James Wyngarden to establish a Coordinating Committee to oversee this effort.***[I am assigning] Recommendation #4 [concerning Dialyzer Reuse [to] FDA***." [NOTE: SEE 12/14/82 AND 2/18/82 ENTRIES ABOVE, AND 10/5/83 ENTRY BELOW.]
3/15/83	Lttr to Sen. Specter from Robt. Wetherell, Assoc. Commissioner, FDA. RE: response to Specter's 2/18/83 lttr concerning Robt. Rosen, dialysis patient. [NOTE: THIS LTTR IS ALMOST IDENTICAL TO 12/7/82 FDA LTTR TO PA. STATE SENATOR RHOADES.] "Most manufacturers have chosen to label dialyzers in the U.S. 'for one time use only'. ." [NOTE: ALL MANUFACTURERS LABEL DIALYZERS 'FOR SINGLE USE ONLY'; ALSO, SEE FDA 8/1/84 LTTR BELOW.]
5/11/83	42 CFR Part 405. "Medicare Program; End-Stage Renal Disease Program; Prospective Reimbursement for Dialysis Services and Approval of Special Purpose Renal Dialysis Facilities; Final Rule", HCFA, DHHS, Fed. Reg. p. 21272, Vol. 48, No. 92. HCFA publishes final regulations on Medicare ESRD reimbursement rates and declares that HCFA is neutral on reuse of dialysis devices. "Reuse is prevalent in Europe and many facilities in the United States reuse. Preliminary studies show that reuse is successful where it is done properly. Nevertheless, we do not presently require or

prohibit reuse. We will continue to study dializer reuse, and to monitor outcomes of those facilities that reuse dializers***to determine *** should we revise the program's health and safety, as well as reimbursement, requirements. ***The regulations establish a prospective reimbursement rate for in-facility and home dialysis of $127 per treatment. The hospitial dialysis rate is set at $132 per treatment.

7/6/83 Memo to Asst. Dir., Education and Communication, CDRH, FDA, from Mark Barnett, Dir., CDRH, FDA. RE: Meeting of CDRH working group on dialiyzer reuse, July 1, 1983. ". . Working group agreed to the following points.***It is granted that we do not have a definitive answer to the question of long term risk from dializer reuse, on the other hand there may be risk[s] from single use, which are also unknown. Given the fact of ever increasing reuse, and the encouraging lack of evidence of short term ill effects from studies to date, we should proceed to investigate the need for and possibly develop guidelines on reuse procedures.***The need for guidelines is presumptive: we do not have evidence that poor reuse practices are necessarily occurring, or that the reuse practices of some institutions are inadequate.***Guidelines will***provide assurance to patients and organized patient groups that the gov't has studied the matter and has endorsed certain principles and/or procedures as adequate. Note too, that patient [groups] as well as key medical organizations must play an active role in developing/endorsing the guidelines. The best way to develop the guidance will be through a joint NIH-FDA Consenus Development Conference. This vehicle will ***assure***participation of the right groups.***Conferees should deal***also with important issues of long term risk (do we know enough to develop guidelines?), the need for the guidance, and the question of which patients *** should not reuse. ."

7/14/83 Lttr to Robt. Rosen, dialysis patient, from Mark Kramer, M.D., President, ESRD Network No. 24 Coordinating Council, Inc., King of Prussia, Pa. RE: response to 8/8/83 Rosen lttr. ". . When a dialyzer is properly sterilized its reuse is considered safe and medically acceptable. ."

8/23/83 Lttr to Robt. Rosen, dialysis patient, Pennsylvania, from J.D. Sconce, Region VI, HCFA. RE: Rosen's questions concerning deaths of 14 dialysis patients in Baton Rouge, Louisiana.

8/30/83 Minutes of meeting (1st meeting), Reuse Committee, FDA, by Lawrence Kobren, Chairperson. "With rising medical costs becoming an important issue, there is a greater probability [of reuse] of medical devices *** in order to cut costs.*** [R]euse of disposable medical devices could have a major impact on the regulatory responsibilities of the CDRH [at FDA].***Topics discussed were: Does the FDA compliance policy *** need revision? *** [I]s the labeling for [dialyzers] adequate [for reuse]? *** If reuse of a device is a medical decision, does the FDA have authority to prepare guidelines for the physician? If not, who should? Should FDA *** educate users of reused devices on the proper way to clean and sterilize devices? . ."

9/15/83 Minutes of meeting, Reuse Committee, FDA, by (unsigned). "Dr. Villarroel briefed the committee on the activities of the [Program Management Staff (PMS] ESRD Coordinating Committee.***A definition for reuse of medical devices was discussed.***Dr. Villarroel will continue his activities with regard to the PMS ESRD coordinating committee."

10/3/83 Minutes of meeting, Reuse Committee, FDA, by (unsigned). ". . Dr. Villarroel *** indicated that the memo to Dr. Brandt from the PHS Committee will endorse the concept of initiating a program using HCFA data to compare the outcome of patients treated with dialyzers one time and multiple times. The memo, however, will not include any recommendation concerning guidelines for reuse. ."

10/5/83 Memo to Asst. Secretary for Health, DHHS, from Lester Salans, M.D., Director, NIADDKD, NIH, and Chairman, PHS Coordinating Committee for ESRD. RE: Report of Committee. ". . [T]his Committee was established by you on 2/11/83 to develop a coordinated response to the recommendations contained in the February 1982 Report of the Intradepartmental ESRD Strategic Work Group [SEE 2/18/82 ENTRY ABOVE]. "SUMMARY: RECOMMENDATIONS OF THE PHS ESRD COORDINATING COMMITTEE. INTRADEPARTMENTAL ESRD STRATEGIC WORK GROUP RECOMMENDATION NO. 1--That HCFA be authorized to implement a comprehensive Departmental ESRD database: The PHS Coordinating Committee concurs***.*** III. INTRADEPARTMENTAL *** WORK GROUP RECOMMENDATION NO.3--That NIH and HCFA individually and cooperatively develop a cohesive research plan: The PHS Coordinating Committee concurs and notes that it addresses two areas: (A) basic and clinical research and (B) program research and evaluation.*** VI. INTRADEPARTMENTAL *** WORK GROUP RECOMMENDATION NO. 6--That PHS/FDA be authorized to begin clinical trials to determine the effects of hemodialyzer reuse: The PHS Coordinating Committee does not agree *** that clinical trials *** be initiated.*** [D]ialysis using reprocessed consumables is clearly a widely accepted modification of standard treatment***A remaining issue, however, is the lack of systematic data on long-term morbidity or benefit in the reuse of dialysis consumables. To address this specific need, the PHS Coordinating Committee recommends that (1) HCFA should include information on dialyzer reuse in its comprehensive *** ESRD data base***and (2) using this data base, FDA [should] initiate a study to compare the outcome of patients treated with dialyzers used once vs. multiple times. This study should be for a period of no less than five years***The PHS Coordinating Committee recognizes that--even when careful dialyzer reprocessing and preparation procedures are followed--the possibility of long-term effects, or very infrequent acute adverse effects, cannot be ruled out completely."

11/9/83 Minutes of meeting, Reuse Committee, FDA, by L. Kobren. "The Georgetown U. Conference on Hemodialysis was briefly discussed.***Dr. Villarroel requested that the Committee review a draft Memorandum of Need (MON) for guidelines in the reuse of [dialyzers].***It was suggested [that AAMI] could establish a committee to develop guidelines if FDA provided, as a result of the MON, the necessary risks and hazards data. ."

11/17/83 Initial FDA inspection (by CSO Nicholas R. Nance) of manufacturer of a dialyzer reprocessor machine. "*** A 510(k) letter has been received for this device. *** I recommend a prompt GMP inspection of this firm." Attachment--FDA EIR, 10/4-23/84, on inspection of the manufacturer of dialyzer reprocessor [NOTE: SEE 10/4/86 ENTRY BELOW].

11/30/83 FDA "Dear Doctor" letter. RE: requirements for appropriate rinsing of new dialyzers to avoid severe hypersensitivity reactions with new dialyzers.

12/5/83 Minutes of AMMI Reuse Committee mtg. (1st mtg.), Washington, D.C. [Attended by Lee Bland, CDC, and L.

Kobren, FDA]. "[T]he meeting was convened to initiate work on a national consensus guideline for reuse of [dialyzers]." [NOTE: REFERENCE TO AD HOC GROUP--FDA, HCFA & NIH--TO STUDY MORBIDITY/MORTALITY IN REUSE.]

12/22/83 Memo to Office Directors & OTA Division Directors, CDRH, FDA, from Joseph Arcarese, CDRH, FDA. RE: Identification, Description and Analysis of Dialyzer User Problems (concerns about reuse and 1st use syndrome). "*** [S]tuding dialysis problems and taking appropriate programmatic actions to solve or ameliorate them ought to be high on our priorities ***."

1/9/84 Medical Device Report (MDR) to FDA regarding dialysis machines. "On all dialysis machines, bicarbonate baths were checked and [sodium] levels were critically low. [Company] was notified of the problem. Problem was solved by discarding Lot No. W304 (46 bags) and replacing with new batch."

1/25/84 Minutes of meeting, Reuse Committee, FDA, by (unsigned). "The Canadian letter [from Dr. Kay of the Montreal General Hospital dated 8/15/83 and] requesting FDA funding for a [dialyzer] reuse study was . . denied because the [U.S.] government does not normally fund foreign research. . The MON for developing a guideline for reuse of [dialyzers] . . is no longer needed, since [AAMI] has agreed to develop a guideline. . Mr. Villforth will present a speech on regulatory concerns [at the Georgetown U. Reuse Conference] . . Mike Miller of AAMI is meeting with CDRH staff to explore possible FDA financial support for the development of the guidelines. ."

1/27/84 Memo (by Wendy Johnson) of meeting between Wendy Johnson, CDRH, FDA, and Bill Tobert and Rick Fenton of HCFA. RE: possible FDA/HCFA Interactions with regard to Dialysis. "*** We discussed the possibility of FDA generated questions be added to [HCFA's] survey form [as part of the annual HCFA survey]."

3/9/84 >Lttr to Tom Scarlett, Gen. Counsel, FDA, from J.Kevin Rooney, Atty. Re: Reuse and resterilization of Hemodialysis devices. [Rooney advises that HCFA reimbursement rate reduction has initiated a practice of reuse of dializers and blood tubing sets; He warns that the cleaning and sterilization process is not uniform.] ". . Kidney Foundation Revised Standards for reuse dated 12/2/83 ***when compared to pharmaceutical industry practices are antiquated and from the stoneage. The standards allow for bloodclots in recleaned equipment. ." [NOTE: SEE 4/19/84 FDA LTTR BELOW.]

3/28/84 "Notes" of AAMI Reuse Subcommittee mtg., Washington, D.C. [attended by L. Kobren]. The "Preliminary Draft" of the "AAMI Recommended Practice: Reuse of Hemodialyzers" was discussed, including whether or not reuse of "products such as blood lines" should be included or excluded. [RE: RECENT OUTBREAK OF DISEASE AT A CENTER IN LA.]-- "Nontuberculous mycobacteria *** can readily survive 2% formaldehyde after 24 hrs. of exposure.***If the concentration *** is increased to 4%, none of the strains of [the bacteria] survive beyond 24 hrs.***[A] dialysis center is faced with two alternatives.***[One] could rely entirely upon aseptic techniques throughout the reprocessing procedure *** Most centers do not have the capability of undertaking such a closed-system and experienced approach. The second option would be to use 4% instead of 2% formaldehyde . ." [NOTE: THE 6/30/81 NIH-SPONSORED REPORT RECOMMENDED 2%, BUT INCLUDED A REFERENCE TO CDC SUGGESTION FOR 4%.]

4/12/84	Lttr to Robert Taylor, Associate Administrator, Division of Health, Standards and Quality Region III, HCFA, from Frances Bowie, Service Facility Regulation Administration, Dept. Consumer and Regulatory Affairs, D.C. Government. RE: referral to HCFA of complaint received by Bowie. ". . Mr. Bland [of CDC] stated that CDC does not have a reuse blood line policy, but recommends that hospital guidelines for central service department would be appropriate in reuse processing areas.***We need to know HCFA's policy on re-using blood lines *** [W]e will need written guidelines on how to monitor its use. ." [SEE LTTR OF 7/3/84, 10/3/85 AND 11/18/85 BELOW]
4/12/84	Minutes of meeting, Reuse Committee, FDA, by L. Kobren. "[C]onsensus of the committee [on the GTU Reuse Conference was] that few if any real problems with reuse were defined. ***Some persons [at the conference] who reuse *** stated that it would be helpful if the manufacturers would provide guidance in the labeling [concerning] use of certain cleaning materials, sterilization procedures, or high level disinfection procedures.***[A draft] letter *** prepared for Mr. Villforth's signature *** requests [General Counsel] opinion and interpretation of 21 CFR 801.4 which requires manufacturers who are aware that their device is being used for purposes other than for which it was intended to address that use in their labeling.***The 1981 ***compliance policy regarding reuse was discussed. More pressures are being exerted for reuse *** [T]he 1981 compliance policy on reuse] policy should be reexamined in light of these new pressures and we should consider whether revision or modification of our policy is necessary. The Committee decided it might be helpful to develop a Center Guideline on the various issues of reuse, such as sterility, disinfection, cleaning, and materials."
4/19/84	>Lttr to J. Kevin Rooney, Atty., from Walter Gundaker, Dir. Office of Compliance, CDRH, FDA. Re: response to Rooney's 3/9/84 lttr concerning reuse. "Hospitals that utilize raw material in the mfgr. of drugs are regulated by FDA as drug mfgrs. and are required to register as such. This is not the case with hospitals involved with the use of hemodialysis devices which are recleaned and reused. In the case of reuse of dializers a patient-doctor relationship exist. If the doctor orders the reuse of a dializer on his patients, we have considered this to be in the realm of the practice of medicine, which is controlled by other governmental bodies, more specifically, state authorities. ." [SEE 3/9/84 ROONEY LTTR ABOVE; ALSO, NOTE: MOST STATES DO NOT HAVE LICENSURE AUTHORITY OVER DIALYSIS FACILITIES.]
4/20/84	Lttr to R. E. Easterling, M.D., chairman, AAMI Reuse Subcommittee, from M. S. Favero, Ph.D., CDC. RE: rationale for justification of using 4% formaldehyde. "Obviously, much of [your] concern [about using 4%] deals with the increased rinsing time required to remove residual formaldehyde. . CDC has never felt comfortable with the use of 2% formaldehyde *** [W]e are in the midst of a study *** of 150 *** dialysis centers *** [W]e have completed assays on 39 such centers and have detected mycobacteria in water in 35 of them. Consequently, I think the problem of mycobacterial contamination is much more widespread than we ever anticipated."
5/4/84	Minutes of AAMI Reuse Subcommittee mtg., Washington, D.C. [attended by M. Favero, CDC, & L. Kobren & F. Villarroel of FDA] "[T]he subcommittee agreed to delete *** the recommended practice dealing with informed consent.***[A] CDC survey in progress showed that *** mycobacterial contamination is far more common than previously thought." [NOTE: SEE 4/20/84 CDC LTTR ABOVE.]

5/10/84	Minutes of meeting, Reuse Committee, FDA, by (unsigned). "[A] memorandum from Mr. Villforth to General Counsel request[s] a legal opinion on the applicability of [21 CFR] 801.4 *** Office of Standards and Regulations is requested to review [21 CFR] 801.4 and the draft reuse policy and give a legal opinion of both.***Review of AAMI Guideline for Reuse . ."
7/3/84	Memo to Patricia Harfst, Dir., Div. of Institutional and Ambulatory Services, HCFA, from Claudette Campbell, Acting Chief, Survey and Certification Review Branch, Region III Office, HCFA. RE: complaints from D.C. state survey agency concerning reuse of blood lines in a dialysis center. "CDC does not have a reuse blood line policy *** We feel that the health and safety issues involving reuse of the dialyzer are similar in this situation. There should be a national policy disposition regarding the reuse of blood tubing in order to ensure the protection of the health and safety of patients.*** We expect that the above will become a national concern . ." [NOTE: SEE 11/18/85 HCFA LTTR BELOW.]
7/3/84	Memo to General Counsel, FDA, from John Villforth, Dir., CDRH, FDA. RE: Request for Legal Opinion of the Applicability of Section 21 CFR 801.4 [to reuse of devices]. [NOTE: SEE 9/25/84 OGC OPINION BELOW.]
7/18/84	>Regulations, Colorado Department of Health: Single Use Disposable Medical Devices. RE: Reuse of dializers. "The regulations are proposed to control the re-use of single-use or disposable medical devices. Without such regulations, the public health [and] safety may be jeopardized.***Prior to individual dialyzer regeneration, each patient shall be provided by the physician with a presentation of possible complications and hazards and possible benefits of such regeneration. This shall be incorporated into the consent for dialysis form *** No person shall be denied access to dialysis in the facility as a result of the patient's refusal to permit regeneration of his or her dialyzer. Water used to formulate cleaning solution and to rinse dialyzers shall be passed through a reverse osmosis membrane, ultrafiltration membrane or a submicron filter.***If formaldehyde is used as the disinfecting agent, a minimum concentration of 2% in both the blood and dialysate compartments, and minimum exposure time of 24 hours if required."
8/1/84	Lttr to Robt. Rosen, dialysis patient, Pennsylvania, from John Villforth, Dir., Center for Devices and Radiological Health, FDA. RE: response to Rosen's 5/31/84 lttr addressed to President Reagan and concerning reuse of dialyzers. ". . [D]ata*** supports the safety and efficacy of the reuse of dialyzers. ***We agree, however, that the safety and efficacy of reuse is still a subject of some discussion.***[T]here are some reports in the literature regarding potential adverse affects of reuse *** FDA regulates the manufacturer and/or distributor of the device. We do not regulate the user.*** Our policy *** is to place the responsibility for reuse on the user *** [T]he Center has initiated programs which will develop data on [dialyzer] equipment, including the reuse of dialyzers.***CDRH is represented on the [AAMI] committee which is developing guidelines for the reuse of [dialyzers]." [NOTE: SEE FDA LTTRS OF 10/22/82, 12/7/82 & 3/15/83 ABOVE; ALSO, SEE FDA'S 9/10/84 & 9/12/84 LTTRS BELOW.]
8/10/84	Memo to Director, Office of Survey and Certification, HSQB, HCFA, from Robt. Streimer, Dir., Office of Coverage Policy, Bureau of Eligibility, Reimbursement and Coverage, HCFA.

RE: Policy Guidance Regarding the Reuse of Disposables for Renal Dialysis (Your memo of 7/17/84). "In your memo you mentioned a need for interim policy guidelines to address recent complaints about reuse of *** dialyzers and blood line tube sets.***[We] have no evidence of specific cases where reuse caused medical problems.***[R]esults of [the AAMI study] are expected to be released in January 1985.*** We believe it is premature to consider any change in the regulations, as you suggest, until the results of the [AAMI] project are evaluated. ."

8/17/84 Lttr to Robt. Rosen, dialysis patient, from Don Nicholson, Asst. I.G., DHHS. RE: response to Rosen's 5/31/84 lttr on reuse of dialyzers. "My office is charged with assuring the integrity of the Medicare program against possible fraud and abuse violations. However, the issue of dialyzer reuse falls specifically within the purview of [HCFA].***I feel confident that all of your concerns will be fully addressed by HCFA." [NOTE: SEE 1/15/81 DHHS OIG MEMO ABOVE.]

8/20/84 Lttr to Perry Ecksel, Kidney Patient's Association, Philadelphia, Pa., from Senator Kennedy. RE: response to Ecksel concerning reuse. "FDA . . has received numerous letters of concern about the issue of reuse of kidney dialyzers. The policy of reuse of [these] devices is not directly regulated by the FDA. . If you are aware of specific instances of billing Medicare for new devices when in fact re-use of disposable items has instead taken place, you should report these instances immediately to [the DHHS OIG]. ."

8/22/84 Minutes of AAMI Reuse Subcommittee mtg., Chicago, Ill. [attended by L. Bland, CDC, & F. Villarroel, FDA] "The committee decided to exclude reuse of blood tubing from the recommended practice.***An unexplained elevation of the serum creatinine should be cause for reevaluation of the reprocessing procedure."

8/27/84 Lttr to Perry Ecksel, Kidney Patients Assoc., Philadelphia, Pa., from Henry Desmarais, M.D., Dir., Bureau of Eligibility, Reimbursement and Coverage, HCFA. RE: response to Ecksel's inquiry on reuse of dialyzers. "[R]esults of a study *** conducted by [AAMI] are expected to be released by January 1985.***While there have been reports of isolated problems with dialyzer reuse during the past few years, the documentation does not support a finding that reuse is detrimental to patient health and safety.***We can understand that ESRD facilities may wish to encourage *** reuse *** as a cost containment measure, but there is no provision in the law permitting treatment to be stopped if patients will not cooperate."

9/4/84 > Memo of Meeting to L. Kobren file, DCRH, FDA. RE: Summary notes of meeting between Kobren, Chair FDA Reuse Committee and Villforth, Dir. CDRH, FDA. RE: Robt. Rosen, dialysis patient, lttrs concerning dialyzer reuse. "[Kobren]*** described to Villforth the various points Mr.Rosen has made in his various lttrs and discussed our [FDA] responses. [MR. VILLFORTH AGREED THAT ANY FUTURE CORRESPONDENCE RELATED TO REUSE OF DEVICES SHOULD BE REFERRED TO THE CHAIRMAN OF THE REUSE COMMITTEE.]

9/10/84 Lttr to Sen. Specter from Robt. Wetherell, Assoc. Commissioner, FDA. RE: response to Sen. Specter 7/18/84 request concerning Robt. Rosen, dialysis patient. ". . Our latest letter to [Rosen] dated August 1, 1984 was in response to a letter he wrote to President Reagan on May 31, 1984.***I believe our response to his letters fully explains FDA's position with regard to the issues he has raised.***[A]s we have explained to him, many of his concerns are beyond the regulatory authority of FDA." [NOTE: SEE 9/12/84 FDA LTTR BELOW.]

9/12/84 Lttr to Robt. Rosen, dialysis patient, from John Villforth, Dir., Center for Devices and Radiological Health, FDA. RE: response to Rosen's 8/6/84 lttr. ". . [Y]our concerns about the reuse of [dialyzers] *** are matters outside the jurisdiction of the FDA and must be worked out between the patient and his *** physician.***[T]he FDA is doing whatever it can, within its authority, to protect the public health by developing data on the reuse of these devices and working with voluntary standards committees to develop effective protocols for proper processing."

9/17/84 Lttr to Robt. Rosen, dialysis patient, from Lawrence Kobren, Chairman, Reuse Committee, CDRH, FDA. RE: response to Rosen's 7/25/84 lttr. ". . The FDA takes no position with respect to the decision to reuse a medical device. That decision is between a physician and the patient, and the FDA will not interfere with that process. ."

9/25/84 Memo to John Villforth, Dir., CDRH, FDA, from Ann Witt, OGC, FDA. RE: Reuse of Medical Devices; Adequate Directions for Use. "This memo responds to your request of July 3, 1984, for a legal opinion as to whether FDA can require mfgrs. of medical devices currently labeled 'for single use only' to provide adequate directions for reuse. For most devices, it is unlikely that FDA could sustain such a requirement, if imposed under a theory based on 21 CFR 801.4 that wide reuse of a disposable device by consumers constitutes a new 'intended use' of the device for which adequate directions are required. The courts have held that an 'intended use' could be established through consumer use only if consumers used the device for the use in question 'nearly exclusively'; moreover, certain factors suggest that the agency might not prevail in requiring directions for reuse even with a product as frequently reused as hollow fiber dialyzers. ."

9/28/84 Lttr to Perry Ecksel, Kidney Patients Association, Philadelphia, Pa., from Henry Demarais, M.D., Dir., Bureau of Eligibility, Reimbursement and Coverage, HCFA. RE: response to Ecksel's inquiries. ". . Under the law, [HCFA] is not authorized to recommend or prevent reuse of renal devices. Guidelines established by the FDA and the [AAMI] will be released *** after January 1985 and will address all of your concerns."

10/4/84 (Beginning date of) FDA Establishment Inspection of manufacturer of a dialyzer reprocessor machine. Numerous GMP deficiencies were documented in the 52-page (including attachments) Establishment Inspection Report (EIR)

10/23/84 Memo to Senior Staff, CDRH, FDA, from William Dierksheide, Ph.D., CDRH, FDA. RE: Dialysis Use Committee Report. "[The report] has been completed and is being sent to you for your information. This document is for internal planning purposes only. Because its findings are inconclusive, the Committee asks that the report not be distributed outside the Center. Although the Committee conducted an extensive search for information on device-user interactions, the yield was minimal. As a result, the Committee concluded that it could not recommend a comprehensive educational program at this time. ." (attached) "Report of the Dialysis Use Committee" (3 pages). "Recommendations *** Dialysis System Investigations Contracts (RFP 223-84-4276) be designed to address user-related problems listed in the report. . . The Committee believes that installation of proper water

treatment systems (using the AAMI standard as a guide) is of utmost importance to protect the health of dialysis patients***."
Report Attachment A--"Summary of Possible User Related Problems" (3 pages)
Report Attachment B--"Elaboration of Possible Problems" (36 pages of accidents, malfunctions and patient injuries)
Report Attachment C--Comments from the Gastroenterology/Urology Advisory Panel" (THIS ATTACHMENT IS MISSING FROM DOCUMENT).

12/7/84 Minutes of AAMI Reuse Subcommittee mtg., Washington, D.C. [attended by L. Kobren, FDA] Sec. 9.4.1.1 of draft "Recommended Practice" was reworded to state: "[CDC] recommends a concentration of 4% [formaldehyde] *** lower concentrations or shorter contact times are appropriate if adequate disinfection can be demonstrated."

12/31/84 Lttr to Perry Ecksel, National Kidney Patients Association, Philadelphia, Pa., from Edward Brandt, Jr., M.D., Asst. Secretary for Health, DHHS. RE: Response to Ecksel's 10/30/84 lttr to Secretary Heckler concerning reuse of dialyzers. "As a physician, I can assure you that your question concerning a patient's right to demand what you describe as 'a sterile treatment' in lieu of reprocessed equipment'***without the threat of reprisals' relates to the physician-patient relationship and is beyond the scope of the legal authority of the [FDA] or the [DHHS]. Prior consent, whether involving reuse *** or any other procedure, must be arrived at between the physician and the patient, and this is not an area in which FDA or HHS should properly be involved.***[P]hysicians and patients may differ *** as to whether specific consent for using reprocessed [dialyzers] is required.***[T]he majority of dialysis facilities reprocess [dialyzers], lending support to the premise that multiple use of [dialyzers] can now be considered standard medical practice.***If there are physicians who believe that they have the right to refuse treatment to patients who do not consent to reuse of dialyzers, then I would hope the matter could be resolved between patient organizations such as yours, the Nat'l Kidney Foundation *** and individual physicians or physician organizations.***FDA is working with the [AAMI] to develop a recommended practice for reuse.***[S]urely, for the majority of dialysis patients, an honest and trusting relationship with the physician providing treatment should be a guarantee of quality treatment whether reuse is practiced or not. ."

2/13/85 Memo to Reuse PMS (program mngmt. staff) and to DEPO, CDRH, FDA, from L. Kobren, OTA (Office of Training & Assistance), CDRH, FDA. RE: Reuse Policy Outline. "***2. Reprocessing in a Clinical Facility: b. Device used on same patient (time period of use immaterial). FDA Policy--responsibility on user (reprocessor), (see CPG 7124.16 which has to be updated): no inspections; no GMP requirements; written protocols required; adverse reactions related to reuse or its procedures reported to FDA through MDR process; FDA may initiate educational information if required. Note: reprocessor not considered a mfgr. since no commercial activities are occurring . ." [NOTE: SEE 12/6/85 FDA WORKING PAPER ON REUSE POLICY, BY KOBREN, BELOW.]

3/5/85 Lttr to Carolyne Davis, Administrator, HCFA, from U.S. Rep. Fortney Stark, Chairman, Subcommittee on Health, Committee on Ways and Means. RE: concerns about reuse of dialyzers. ". . [M]any beneficiaries are concerned about the health implications of reusing devices that are labeled for one time use only. Many beneficiaries say they are being asked, and sometimes forced, to reuse.***The preponderence of *** evidence seems *** to indicate that reuse *** does not expose the patient to serious adverse health risks. I am concerned, however, that there are currently no generally accepted guidelines or regulations defining standards for reuse *** Please comment on the appropriateness of *** mandating an informed consent arrangement between the facility/physician and the beneficiary who is being asked to reuse. ."

3/5/85 Lttr to Frank Young, M.D., Commissioner, FDA, from U.S. Rep. Fortney Stark, Chairman, Subcommittee on Health, Committee on Ways and Means. [NOTE: THIS LTTR IS IDENTICAL TO THE 3/5/85 STARK LTTR TO HCFA ABOVE, EXCEPT FOR THE FOLLOWING:] "As a [dialyzer] is *** a medical device, is this not an area in which the [FDA] should be involved in? [W]hat role [do] you see the FDA playing in the *** reuse issue? [I]s there a need for regulations governing reuse, or at least guidelines? *** I am concerned that very little attention appears to have been given by the FDA to the practice of dialyzer reuse. ."

3/14/85 Minutes of meeting, Reuse Committee, FDA, by Nancy Clements. ". . Kobren *** requested Committee input regarding the reuse policy.***[There was discussion of the upcoming] annual Georgetown U Conference on Reuse.***[There was] lengthy discussion *** on the draft outline of the Center Reuse Policy. Legal definitions of commerce (vs. profit), repair, reprocess, user manufacturer, etc. were discussed at length. Several Committee members expressed the opinion that the reuse policy should retain FDA's broad authority to inspect "manufacturers" but provide exemptions for hospitals, clinicians, and physicians."

4/8/85 Lttr. to Elizabeth Bridgman, Mngr., Technical Development, AAMI, from M. Favero, CDC. "[B]acteriologic and endotoxin quality of water for reprocessing dialyzers is one for which there is not a complete consensus among the committee members.***[T]here should be some degree of quality control on this type of water.***If one uses the AAMI bacteriologic standard *** there is no guarantee that the organisms of greatest concern, the non-tuberculous mycobacteria, will be reduced since the current culture methods do not allow for their detection and their is no feasible quantitative standard.***There have been reports to the CDC where water *** which contained endotoxin subsequently resulted in pyrogenic reactions.***We have no idea of the frequency of this type of episode *** However, the risk appears to be real. . [I]f a choice were to be made between doing an endotoxin test versus a bacteriologic assay on water meant for reprocessing we would favor using the endotoxin test. ***In addition to the major outbreak of infections in Louisiana there have been two instances where non-tuberculous mycobacterial infections in dialysis patients reported to CDC. We continue to believe strongly that 2% formaldehyde *** is inadequate for reprocessing of a medical device *** The probability that viable microorganisms will be contained in the dialyzer as the result of using this inadequate procedure is high.***[R]esults of our survey of 115 dialysis centers *** show that over 80% of these centers had mycobacteria in water associated with the center. These organisms cannot be ignored.***How many outbreaks *** among *** patients are needed to indicate that 2% formaldehyde is an inadequate procedure?

4/10/85 Lttr to U.S. Rep. Fortney Stark, Chairman, Subcommittee on Health, Committee on Ways and Means, from Carolyne Davis, Administrator, HCFA. RE: response to Stark's 3/5/85 lttr. "I am acutely aware of the controversy [over the absence of standards for reuse].***At the present time, I believe the question of reuse is a medical practice issue which, in the absence of specific guidelines from the [FDA], should be decided by the patient's physician. A recent study conducted by [AAMI] addresses [reuse].***When we receive the FDA comments [on this study], we will consider what steps, if any, should be taken by [HCFA], including the related question of physician/patient informed consent arrangements.***State surveyers *** do check to determine whether facilities have a written policy covering the number of times dialyzers can be safely used, including procedures for the cleaning, sterilizing and storage of dialyzers. HCFA does not, at present, provide specific standards to facilities, however. ."

4/24/85 Minutes of meeting, Reuse Committee, FDA, by (unsigned). ". . Kobren *** distributed copies of the first draft of the Health Span article on FDA's position on reuse. He also circulated copies of the Center's response to Congressman Stark's letter inquiring whether FDA needed additional legislation to regulate [dialysis] devices.***It was agreed to present [to the PMS] the need for a comprehensive reuse policy as the major issue and the revision of the compliance guides as a subsection.***Dr. Silverman stressed the need to change the word 'objectionable' in Compliance Guide 7424.12. Dr. Gordon and others recommended that the compliance guideline be neutral rather than positive or negative as presently stated. ."

4/26/85 Regional (HCFA Region VI) Health Standards and Quality Letter No. 85-13 To All State Survey Agencies and All Title XIX Single State Agencies. RE: Reuse of Single-Use and Disposable Medical Equipment in ESRD Facilities. ". . [R]euse is becoming a very common occurrence, particularly in ESRD facilities. The medical efficacy and safety of reuse is the subject of great debate and widely differing opinions.***The reuse of single-use items in itself should not be considered a deficiency unless prohibited by facility policy. The reuse of disposable devices without effective policies and procedures governing their reprocessing and reuse in an extremely serious deficiency which may represent a hazard to patient health and safety."(NOTE: this letter resulted from La. citing dialysis clinics for reuse.)

4/30/85 Minutes of AAMI Reuse Subcommittee meeting, Atlanta, Ga. [attended by L. Bland & M. Favero of CDC, and L. Kobren & F. Villarroel of FDA; also, of the 36 ballots cast on the "Recommended Practice", there were 3 negatives and 4 abstentions.] "The point was made that water meeting the limit of 200 colonies per ml could still contain significant amounts of endotoxin.***Consequently, if forced to make a choice, [Favero of CDC] would recommend LAL testing over bacterial colony counts."

5/21/85 Memo to Gordon Oxborrow, Minneapolis Center for Microbiological Investigation, FDA, from James J. Park, CDRH, FDA. RE: Request for study of formaldehyde and glutaraldehyde toxicity in the blood. "Study Objective--To provide FDA with data which will establish the fate of and adverse effects from formaldehyde and glutaraldehyde and their metabolites in blood."

7/2/85 Memo to Reuse PMS (Program Mngmt. Staff) & OTS Reuse WG (working group), CDRH, FDA, from L. Kobren, OTA-DTD, CDRH, FDA. RE: Plan of Action--Reuse Policy. ". . [T]he need for [FDA] to develop a policy on the reuse of medical devices, which we presented at the PMS 'Go-Away', has been accepted as a high priority issue by Center mngmt.***The

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first order of business will be to outline a plan of operation which will describe how we will develop the policy . ."

7/3/85 Lttr to Perry Ecksel, National Kidney Patients Association, Philadelphia, Pa., from Robt. Wren, Dir., Office of Coverage Policy, Bureau of Eligibility, Reimbursement and Coverage, HCFA. RE: response to Ecksel's recent letter about coverage and reimbursement for reprocessed***devices. "The [FDA] is currently examining [the AAMI] study. When we receive the FDA comments, we will consider what steps, if any, should be taken by [HCFA].***Much data has been published which supports the safety and efficacy of reuse. Some of this information was released by the FDA to Mr. Robt. Rosen of your organization, in a letter dated August 1, 1984. ." [SEE FDA's 8/1/84 LTTR ABOVE.]

7/18/85 INTEROFFICE MEMORANDUM TO REUSE PMS AND OTA REUSE WG, FROM L. Kobren, Center for Devices and Radiological Health (CDRH), FDA. RE: Reuse Minutes. ". . Kobren *** informed [the Reuse Committee] that the development of a more comprehensive reuse policy was considered a high priority issue for the Center during FY-86.***Dr. Villarroel handed out a chart which concisely categorized FDA's possible regulation of reused disposable devices.***General Counsel should be consulted early in the process of developing the reuse policy . ."

7/23/85 (Beginning date of) FDA Establishment Inspection of manufacturer of computerized dialyzer reprocessor. "Notice of Adverse Findings. . Inspection . . revealed a substantial lack of compliance with the regulations for 'Good Manufacturing Practice for Medical Devices'. A few of the more significant observations included: inadequate or incomplete device inspections, insufficient documentation describing changes in device software, a lack of documentation to demonstrate certain procedures are subject to quality assurance reviews, inadequate component control and release, and inadequate or missing written procedures covering various aspects of the manufacturing process. ." [NOTE: SEE 8/1/85 NOTICE OF ADVERSE FINDINGS ATTACHED TO FDA EIR, BEGINNING DATE--7/23/85.]

8/85 AAMI (Aug. 1985 Revision) "Recommended Practice For Reuse Of Hemodialyzers (Proposed)", developed by the AAMI's Hemodialyzer Reuse Subcommittee (members include reps from the FDA, CDC, NIH & VA) "NOTE: Participation by federal agency representatives *** does not constitute endorsement by the federal government or any of its agencies.***The committee decided to exclude reuse of blood tubing from the recommended practice since a consensus *** could not be reached *** The committee wishes to make clear that this omission does not reflect a judgement of the merits of reusing the blood tubing.***[Dialyzer] reuse has risen *** from an estimated 16% of patients in 1980 to an estimated 60% of patients in 1983.***[This] increase *** may *** be attributed in part to the availability of new data to support the safety and efficacy of this procedure. The final report to [NIH] on a study [mandated by the Congress in 1978] states: 'Utilization of the specified procedures (for reuse) *** will result in a reprocessed *** [dialyzer] equivalent in terms of function, cleanliness and sterility to a new *** [dialyzer].***If formaldehyde is used, the [CDC] recommends that a concentration of 4 percent be used *** [T]he committee decided, after legal counsel, that [suggested elements of informed consent] is not appropriate for an AAMI recommended practice.***The committee also considered the question of whether there should be the right to freedom of choice [on whether a patient would reuse]. Consensus could not be reached on this issue due to the conflict between individual determination and cost constraints imposed by society. ." [NOTE: THE NIH REPORT CITED ABOVE WAS BASED ON AN UNFINISHED STUDY AND WAS SHARPLY CRITICIZED BY NIH CONSULTANT ARTHUR D. LITTLE, INC. IN THE 10/9/81 ENTRY ABOVE; ALSO, WHILE THE AAMI RECOMMENDED PRACTICE RECOMMENDS A 4% FORMALDEHYDE CONCENTRATION, THE NIH STUDY REPORT RECOMMENDED 2 %.]

8/8/85 INTEROFFICE MEMORANDUM TO REUSE PMS & OTA REUSE Working Group, FROM L. Kobren, CDRH, FDA. RE: Reuse Committee minutes. ". . Kobren presented OTA's(?) planning schedule for development of the reuse policy.***On September 4, Mr. Arcarese and Larry [Kobren] will brief Mark Heller, [General Counsel], on the reuse policy. Dr. Andersen, [Office of Standards and Regulation], will also be [at] the meeting *** There was considerable discussion about whether or not the center had enough data on reuse to develop a reuse policy. It was concluded that the policy should be developed without detailed information on specific device reuse. ."

8/12/85 Medical Device Report (MDR) received by FDA regarding incident in which "patient on dialysis experienced a burning sensation in his vascular access area, shortness of breath and elevated blood pressure. Dialysis was discontinued and symptoms disappeared. They felt that this was a renalin reaction and found indications of renalin in the dialysis compartment of the dialyzer used on the patient. It was found that the dialysis technician had failed to make the pre-dilution prior to connecting the renalin concentrate" to the dialyzer.

9/25/85 (Beginning date of) FDA Establishment Inspection of manufacturer of an automated dialyzer/bloodline reprocessing machine. "REGULATORY LETTER RECOMMENDATION [,dated 11/25/85, to Center for Devices and Radiological Health, FDA, from Dale Allen, Compliance Officer, Denver District Conpliance Branch, FDA]. This firm's primary product is a device to clean and sanitize kidney dialysis machines so the user can avoid the expense of replacing filters and tubing sets. The . . inspection revealed deviations from current Good Manufacturing Practices in almost every aspect of their activities. No audits have been conducted. Complaints and field failures were not properly investigated. . Device master records were not approved. Device history records were missing in whole or in part. Calibration of test equipment was inadequate. The devices . . have not been on the market very long, and the numbers of complaints and field problems are not impressive. Our feeling is, however, that this is a "situation 2" and there is reasonable possibility, without improvement, of production of defective devices. Firm warning by means of a regulatory letter is the action of choice. Both of the manufacturer's devices have been introduced into interstate commerce before the 90 day time period cited in Section 510(k). We included misbranding charges for these acts. ."

9/26/85 Death of 86-year old female patient with implanted Hemasite Vascular Access device, reported by Regional Kidney Disease Program in Minneapolis, MN. "Certificate of Death states overwhelming sepsis due to septic arthritis due to staph dialysis access infection . . Doctor felt that had the device been removed, death may not have occurred. Device was implanted for approximately 4 years. The general feeling of the doctor was that the device had a constant, persistent exit site infection for approx 204 days before death occurred." [NOTE: MDR received by FDA 12/9/85].

10/3/85 Lttr to Robert Taylor, Associate Regional Administrator, Div. of Health Standards and Quality, Region III, HCFA, from Frances Bowie, Service Facility Regulation Administration, Department of Consumer and Regulatory Affairs, D.C. Government. RE: the need for clear guidelines from HCFA on reuse. ". . the district does not have any licensure regulations for dialysis facilities or for reuse, and the federal ESRD regulations do not have clear guidelines on reuse, we are unable to enforce or persuade the facility to follow the standards of practice on reuse established by AAMI or the Kidney Foundation. Per the district's letter of Sept. 12, 1984 once again clear direction from Region III is requested on the position of HCFA on reuse. [NOTE: SEE 4/12/84 AND 7/3/84 ABOVE AND 11/18/85 BELOW]

10/25/85 Speech by John Villforth, Dir., CDRH, FDA, at the Georgetown U. annual conference on reuse of disposable medical devices. RE: Reuse Of Disposable Medical Devices: Regulatory Considerations. ". . Recently *** the pressure to reduce costs by reusing disposable devices has been growing. Our concern is that as more devices are reprocessed by people with less experience in reprocessing techniques, the possibility of adverse effects to the patient increases. For these reasons FDA is developing a more comprehensive reuse policy. We also intend to examine our compliance policy guides *** Does simply labeling a device for 'single use' or 'disposable' automatically make it unfit for reuse? *** What labeling should be required with a reprocessed device? *** Should references to acceptable voluntary standards for reprocessing be included in the labeling? These and many other complex issues have to be discussed within the agency *** before any policy can be developed.***AAMI's Recommended Practice for the Reuse of Hemodialyzers *** could result in less FDA regulation.***The [JCAH] could review a facility's reprocessing procedures to determine compliance with these minimum voluntary standards.***FDA is neither for nor against *** reusing disposable medical devices. We are for the safe and effective use of medical devices . ."

NOV. 1985 "The Journal Of Infectious Diseases", Vol. 152, No. 5, included the CDC report of 6/24/85, "Infections with Mycobacterium chelonei in Patients Receiving Dialysis and Using Processed Hemodialyzers". ". . Between June 1982 and June 1983, 14 (51%) of 27 patients with multiple underlying medical problems died***."[NOTE: THE 14 PATIENTS DO NOT INCLUDE DIALYSIS PATIENT ELAINE SHUMAN WHO DIED IN SEPT. 1983; ALSO, SEE APRIL 1982 ENTRY ABOVE.]

11/5/85 "Hemodialyzer Reuse: Issues & Solutions" (based on proceedings of an AAMI technology assessment conference in L.A. on 11/5 & 6/85). "[R]euse of [dialyzers] is likely to remain a common practice and, therefore, additional systematic studies of morbidity and mortality associated with reuse compared to single use are warranted.***[S]everal of the nonformaldehyde sterilant/disinfectants appear to have satisfactory performance for the disinfection/sterilization of reprocessed [dialyzers]." (Note: the following are statements are by Murray Klavens of NAPHT) "Informed consent is a meaningless expression unless the patient has the ability, with knowledge, to refuse, with impunity, to sign. Instead of talking about whether or not we need informed consent, we should concentrate on how to implement it so that the patient will not feel threatened. . What is needed . . are data covering large groups and generated by clinical studies." (Note: the following are statements by L. Kobren of FDA) "The FDA is *** reviewing its policy on *** reuse of medical devices.***[U]nder study is the labeling authority under part 801.4 of 21 [USC] entitled 'The meaning of intended uses'. [It] states, in effect, that a manufacturer who knows that his device is being used for conditions, purposes, or uses other than those for which it is offered must provide adequate labeling for the device to accommodate those other uses.***We recently received an opinion from the FDA's General Counsel *** which indicates that the agency may not have the authority to use the provisions of this regulation to require manufacturers to relabel their devices for reuse.***The lack of written guidance from the FDA, however, does not mean that the agency will not exercise its authority if it believes it is necessary in order to protect the public health.***We have formed a committee on reuse *** which has been directed to explore all aspects of the reuse question and to recommend, if called for, changes in policy or other actions that the [FDA] can undertake.***We see the role of the FDA as one of providing support, both technical and financial, to the professional community for the development of guidelines for reuse . ."

11/18/85 Lttr to Frances Bowie, Service Facility Regulation Administration, Department of Consumer and Regulatory Affairs, D. C. Government, from Claudette Campbell, chief, Survey and Certification Review Branch, Region III Office, HCFA. RE: response to Bowie's 10/3/85 lttr concerning HCFA position on reuse of dialyzers and bloodlines. ". . There is no official policy with respect to reuse in ESRD facilities participating in the Medicare program at this time.***[T]he draft results of a study by [AAMI] regarding reuse practices has been published and is now in circulation for public comment.***HCFA regulations, policy issuances, etc. will not be amended or changed until all results are finalized. ESRD program modifications will be forthcoming sometime in 1986 based on the AAMI effort. ." [NOTE: SEE 7/3/84 HCFA MEMO ABOVE.]

11/19/85 Lttr to Pa. Governor Thornburgh from Perry Ecksel, Nat'l Kidney Patients Assn., Feasterville, Pa. RE: Re-use of Medical Disposables. ". . [W]e are now caught up in a political game.***The entire issue of re-use has gone totally out of control. In an attempt to further the financial goals of the large corporations and/or physicians, a vast network of medical abuse has erupted."

12/3/85 Lttr to Perry Ecksel (see 11/19/85 above) from Wm. Pfaff, M.D., Nat'l Forum of ESRD networks, Inc. ". . [T]here is no practical way in which the Network Forum can adjudicate a dispute between dialysis patients and a given dialysis unit in Philadelphia. . [In my opinion] re-use is, with appropriate safeguards, appropriate and for all concerned***"

12/4/85 Lttr to Perry Ecksel (see 11/19/85 above) from Robt. Streimer, Acting Director, Bureau of Eligibility, Reimbursement and Coverage, HCFA. RE: lttrs to Secretary HHS on reuse. "While the general question of reuse is a medical practice issue and one which should be decided by the patient's physician, much data has been published which supports the safety and efficacy of reuse.***The FDA is currently examining [the AAMI's Proposed Recommended Practice]. When we receive the FDA comments, we will consider what steps, if any, should be taken by HCFA. ."

12/4/85 Lttr to AAMI from John Villforth, FDA. RE: FDA representatives for participation in AAMI's standards development committees. ". . All [FDA] nominees may be considered as voting representatives and their written ballots will reflect the views of the Center for Devices and Radiological Health. The policy of the [FDA], however, stipulates that participation by these representatives shall not necessarily reflect the agreement of the [FDA] with, nor endorsement of, any decision reached by the committee. ."

12/6/85 "Draft Working Paper; Reuse Policy Considerations", to Dir., Office of Training and Assistance, CDRH, FDA, from L. Kobren, Chairperson, Reuse Committee, CDRH, FDA. ". . Although P.L. 94-295, the Medical Devices Amendments of 1976, makes no mention of the [FDA's] specific authority with respect to reuse of disposable medical devices, the committee believes that FDA has the authority under the existing law to control reuse whether it is practiced by manufacturers or health professionals (including physicians, hospitals, clinics) or patients.***The reuse of disposable medical devices is a very controversial practice which raises many legal, ethical, economic, technical and safety questions.***The reuse committee believes that FDA should take a position which neither advocates nor discourages the practice of reuse, because it believes that the responsibility *** rests with the reprocessor . . Proposed Policy: (1) The reprocessing and subsequent reuse of previously used *** devices should not be considered a "new intended use" [and] therefore the reprocessor should not be required to submit a 510(k) or PMA to FDA; (2) A properly reprocessed *** device should be considered substantially equivalent to the original device; (3) Manufacturers that intend to market devices that they consider to be 'disposable' or 'single use', should substantiate that claim with FDA prior to marketing the device in accordance with existing regulations; (4) Manufacturers that do not authenticate the terms 'disposable' or 'single use', should remove those terms from the label and provide the user with information concerning the material properties of the device; (5) Medical devices that have been authenticated as 'single use' or 'disposable' should not be reprocessed; (6) Persons or facilities reprocessing previously used devices who intend to use the reprocessed device in the same facility, which [device] is not offered for sale or distributed to other facilities or persons, and which [device] is determined to be reprocessed in a manner which is generally recognized capable of producing a device which is as safe and effective as the original device should, in accordance with section 510(g)(4) of the Act, be exempt from any regulatory controls. As long as no adverse effects are associated with the reprocessing, we suggest that FDA consider these devices to be safe and the reprocessing protocols effective. However, a facility that does not have effective reprocessing protocols and/or is consistently shown to reprocess a device which causes injury to the patient, as evidenced by substantiated reports to FDA, should be treated as if it was a mfgr. ." [NOTE: ON 1/10/86, KOBREN STATED THAT FDA WAS NOW CONSIDERING TREATING FACILITIES AND PHYSICIANS AS MFGRS. AFTER ALL.]

12/13/85 Medical Device Report (MDR) received by FDA from Crowley, OH dialysis clinic regarding "potential injury" event associated with Renalin disinfectant. "Dialysis center reports the dialyzer manufacturer suspects the disinfectant (Renalin) and is sending out a field investigator. [Dialyzer] design was recently changed without changing the membrane. Manufacturer of Renalin has heard of other problems with this kidney."

12/13/85 (Beginning date of) FDA Establishment Inspection of manufacturer of disposable dialysis devices ". . Inspection revealed . . serious GMP deficiencies. . Components designated as critical . . were not tested . .

Review of bloodline complaints revealed many instances of inadequate follow-up. ." [NOTE: SEE FDA EIR, BEGINNING DATE--12/13/86.

1/31/86 MDR received by FDA for incident at Baltimore, MD dialysis center, in which "infection ... caused large vegetate growth on mitral valve ... patient not doing well ... was transferred to hospital at the end of November with severe fever, shaking chills and low level of consciousness. It was discovered that her hemasite [vascular access for hemodialysis] was grossly infected."

2/18/86 NOTE TO DR. MACDONALD, Acting DHHS Assistant Secretary for Health, through Steven Grossman, from Marcy Lynn Gross, DPA, OHPE, PHS. RE: Background for Meeting of 2/19/86 on Dialyzer Reuse. "An investigator (Jim Michie) from Senator Heinz's Special Committee on Aging is looking at the dialyzer reuse issue and talking to a number of people in the Department. . [L]egislative staff feels that Dr. MacDonald may wish to consider appointment of a special lead person on the issue, recommend establishment of a task force, or take some other anticipatory action. ."

2/24/86 "Working Paper: Policy Considerations For The Reprocessing Of Devices", by the Reuse Committee, Center for Devices and Radiological Health, FDA. "*** [T]he [reuse] committee believes that FDA has the authority under the existing law to regulate processing of devices for reuse whether it is carried out by the original manufacturers, health professionals or others. *** Federal regulation 21 CFR 820.3(k) defines a manufacturer as 'any person, including any repacker and/or relabeler, who manufactures, fabricates, assembles or processes a finished device'***. Accordingly, the Reuse Committee believes that any person who reprocesses a medical device should be considered a manufacturer. *** The Reuse Committee believes *** that all reprocessors should be required to comply with Good Manufacturing Practice (GMP) regulations (21 CFR 820) to assure that the reprocessed device continues to be safe and effective for its intended use.***"

2/27/86 E. Carter, M.D., NCHSR/HCTA, met with F. Villarroel, Robt. Eccleston, Michael Eck and Larry Kobren of FDA to discuss preparation of testimony for the Aging Committee's 3/6/86 hearing. FDA claimed that mortality of dialysis patients was 12%, but they could not agree on a figure at the meeting. [NOTE: E. CARTER PHONED KRAKAUER--SEE 3/1/86 ENTRY BELOW.]

3/1/86 Henry Krakauer, M.D., HCFA, informed E. Carter, M.D., NCHSR/HCTA that Krakauer's data showed a 19% mortality rate overall among dialysis patients; and, for patients 65 and older, mortality rose to 29%.

3/6/86 The Special Committee on Aging, U.S. Senate, chaired by Senator John Heinz, conducted a public hearing on the reuse of disposable hemodialysis devices. John E. Marshall, Ph.D., Dir., National Center for Health Services Research and Health Care Technology Assessment (NCHSR/HCTA), was the principal witness for the Public Health Service. Bartlett Flemming, Acting Deputy Administrator for HCFA, also testified. [NOTE: SEE THE HEARING RECORD, "DISPOSABLE DIALYSIS DEVICES: IS REUSE ABUSE?", MARCH 6, 1986.]

3/7/86 CONFIDENTIAL NOTE from John E. Marshall, NCHSR Director, to Dr. Macdonald [sic], Subject: Dialyzer Reuse. " . . Prior to today's hearing with Senator Heinz on this subject, I had assumed that we could carry out the assessment within the 60-day period that was specified in your March 5 memorandum. However, the original plan was to have used this as a way of deferring a response to the Senator . . [now] the process will be carried out under the careful scrutiny of committee staff, probably Mr. Mitchie [sic]. The substantive part of our analysis is completed. We had to do that for the testimony. There is nothing new that will be found. But, because of the sensitivity of this and the activation of constituency groups as a result of these hearings, I think it best that we be allowed 90 days for carrying out the study . . I don't expect that Mr. Mitchie [sic] will perceive the study as anything but a whitewash and consequently that will be the Senator's view. But I think we can forestall at least some criticism by going to 90 days."

3/21/86 JH Lttr to Bowen requesting that FDA impose GMPs on reprocessors.

4/3/86 Medical Device Report received by FDA regarding bacteremia outbreak at Daytona Beach, Florida dialysis clinic. "March 24th incident involved a hospitalization. March 25th incident treated at dialysis unit by registered nurses. The March 31st incident involved hospitalization. The April 1st incident was treated on-site by registered nurses. All four patients appeared to suffer a pyrogen-like reaction . . during dialysis with hemodialyzers reprocessed with product-D sporocide. No other reports with same batch."

4/9/86 Memo to Associate Commissioner for Health Affairs, FDA, from E. Carter, M.D., Dir., Office of Health Technology Assessment, NCHSR/HCTA. RE: Reuse of Hemodialyzers. Memo asks for comments from FDA for the NCHSR/HCTA "assessment." [NOTE: SIMILAR MEMOS WENT TO CDC, HCFA & NIH; ALSO, SEE 5/28/86 ENTRY BELOW FOR FDA'S RESPONSE.]

4/16/86 Memo to Bowen from Acting Asst. Sec. for Health McDonald advising Bowen to inform JH that "dialyzer reuse is exempt from FDA regulation". [NOTE: attached briefing paper lists as a "CONCERN: General Counsel says a legal argument can be made for imposing GMPs or not enforcing them on dialysis clinics. It therefore becomes a policy decision."]

4/16/86 Lttr to FDA from Alcide Corp., manufacturer of RenNew-D, a disinfectant used in reprocessing dialysis devices. The firm reported adverse reactions suffered by 7 patients at a dialysis clinic using RenNew-D.

4/17/86 E. Carter, M.D. of NCHSR/HCTA and two of his subordinates visited the Aging Committee staff office to review files assembled for the 3/6/86 hearing on reuse. Carter informed Michie and Cunningham of the Committee staff that he had not seen much of the material, especially internal agency documents. Carter characterized the "Deane Report" (funded by NIH in 1981-82) as "dishonest." Carter asked for copies of numerious documents to be considered in the NCHSR/HCTA's assessment of reuse of disposable dialysis devices.

4/21/86 Memo to Bowen from Anna Boyd, Policy Coordinator/Health, Exec. Sec., DHHS. RE: Heinz 3/21/86 lttr on Reuse. "..Currently, neither HCFA nor PHS have issued any standards for reuse. The Department's position is that the decision to reuse . . is a medical judgement made by the physician.. [S]hould new evidence appear, the Department could consider issuing standards.. FDA strongly opposes applying GMP standards.. and has taken the position that we should tell Senator Heinz.. that the GMP regulations do not apply, in order to 'close the door' to further pressure from the Senator .." [NOTE: SEE ENTRY ABOVE AT 4/16/86; ALSO, SEE ENTRY BELOW AT 4/29/86.]

4/29/86 Lttr to JH from Bowen (responding to 3/21/86 JH lttr--see above). Bowen stated: "...Dialyzer reuse is a recognized medical practice which has a history of safety dating back to 1967...[M]orbidity and mortality statistics have remained unchanged.. Our legal counsel reminds us that the FFDC Act specifically exempts from device regulation 'practitioners licensed by law'. ." [NOTE: SEE NOTE ABOVE AT 4/29/86 ENTRY.]

5/86 Survey report by the D.C. Government on a study of 15 dialysis clinics in D.C. performed under contract for FDA (Calif. & Ohio have done similar studies for FDA). The report cites many problems with reprocessing procedure. Excerpts:
"Sophistication and efficacy of water purification systems are diverse. Several systems installed in the facilities fall short of compliance with [AAMI] water quality standards for dialysis . . Some dialyzer types appear to be less amenable to reuse than others . . Occurrences of blood tubing set failures . . were higher in facilities which practice reprocessing and reuse of arterial blood tubing sets . . Only one facility reports changing the transducer protector with each patient use . . The Department of Consumer and Regulatory Affairs recommends that further studies be conducted in: blood tubing reuse practice . . and the quality and adequacy of orientation/training programs for staff in hemodialysis facilities."

5/6/86 Incident of bacteremia at Dallas Kidney Disease Center. "Patient involved in incident of bacteremia . . in association with reuse of dialyzer." [NOTE: MEDICAL DEVICE REPORT WAS NOT RECEIVED BY FDA UNTIL 6/10/86]

5/7/86 Memo to Director, Medical Staff, Office of Health Affairs, FDA, from James Benson, Deputy Dir., CDRH, FDA (drafted by Kobren). RE: Reuse of hemodialyzers. ". . [We] will provide whatever assistance we can to OHTA in the collection of data they are requesting and in the writing of their final report. Persons available are: Kobren, Villarroel and Eccleston. ."

5/8/86 Entry in log of (Steven Solomon?), Hospital Infections Program, CDC. "Spoke [with] Irving Weitzman[, FDA]. Referred to Marie Reid[, nurse consultant, CDRH, FDA]. Spoke [with] Marie Reid [&] she will send a field rep in LA to dial[ysis] ctr. Spoke [with] Michael Stokke, LA office FDA who will meet Murphy at dial[sis] ctr. Spoke [with] Dr. S.B. Werner of Cal Dept regarding Murphy's trip."

5/8/86 Memo, **"FOR ADMINISTRATIVE USE, LIMITED DISTRIBUTION, NOT FOR PUBLICATION"**, to James Mason, M.D., Dir. of CDC, from Drs. Solomon, Favero and Hughes, Hospital Infections Program, CDC. RE: Pseudomonas spp. bacteremia in [dialysis] patients--California. Phone call to CDC from a community-based dialysis center in Los Angeles, Cal. concerning four patients with Pseudomonas spp. bacteremia who had had onset of symptoms while receiving dialysis during April and May 1986.

5/9/86 Dr. John Murphy, CDC, departed for Los Angeles to investigate the infection outbreak. [NOTE: SEE 5/6/86 ENTRY ABOVE.]

5/10/86 (Beginning date of) FDA Establishment Inspection of dialysis clinic in Inglewood, Cal. (a joint investigation with Dr. John Murphy, CDC), where there had been an infection outbreak (the clinic was using the disinfectant RenNew-D, which was eventually recalled by the manufacturer). Four patients had contracted bacterial infections. [NOTE: SEE 5/6/86 ENTRY ABOVE.]

5/12/86	Senator Heinz and 5 other members of the Aging Committee filed a petition with the FDA seeking to have that agency impose the Good Manufacturing Practices (GMPs) on all reprocessors of dialysis devices.
5/15/86	Two dialysis patients in Napa, California "hospitalized with spiking fever" after reprocessing of their hollow fiber dialyzers by the clinic. "Processing method may have been either manual or automated, but it was not performed according to directions for use." [MEDICAL DEVICE REPORT received by FDA on 5/23/86].
5/16/86	Reuse Option Paper prepared by FDA's Reuse Committee. The draft paper states: ". . [T]he [Reuse] committee believes that a decision by FDA as to how it will address this problem cannot be postponed much longer.. Problems associated with reuse are not reported to FDA because there is no reporting requirement. This has been substantiated at least in the area of hemodialysis, by FDA's recent State contract on hemodialysis (SEE 5/86 ENTRY ABOVE), which indicates that there are many user-related problems, including some aspects of reprocessing, which are unreported. . FDA or some organization must develop uniform reprocessing guidelines or protocols.. If serious problems. . arise there is no clear regulatory authority to prevent the facility from continuing its activities.."
5/17/86	Incident of bacteremia at Dallas Kidney Disease Center. "Patient involved with incident of bacteremia . . in association with reuse of dialyzer reprocessed with disinfectant. Patient recovered." [Medical Device Report received by FDA 6/10/86].
May 1986	Oral Report--Tuesday AM Conference, Intradialytic Bacteremia--Los Angeles (by Dr. John Murphy?) "*** The new disinfection method uses a relatively new commercial germicide [RenNew-D], and allows for a greater number of reuses of each dialyzer.*** We conclude that this cluster [of infections] is etiologically related to reuse of [dialyzer] membranes. Cellulose acetate dialysis membranes, and a higher number of dialyzer reuses appear to be risk factors for bacteremia. A major question at this point is whether the infections were caused by inadequate disinfection of the reusable [dialyzers], or impairment of dialyzer membrane integrity due to repeated disinfection."
5/21/86	(Beginning date of) FDA Establishment Inspection by FDA's Boston District Office of the Alcide Corp., Norwalk, Conn., manufacturer of RenNew-D. The inspection revealed: ". . GMP deficiencies including lack of documentation of investigation of a complaint and failure to report a medical device report, (MDR), for that incident concerning patients that were hospitalized after their dialyzers were reprocessed with RenNew-D. . 'Directions For Use' for this product were found to be inadequate. . The dialyzers in question had been discarded prior to the investigation. . The lot number of the product could not be determined due to poor recordkeeping at the [Dallas Kidney Dialysis Center]. ."
5/28/86	Memo to E. Carter, M.D., Dir., Office of Health Technology Assessment, NCHSR/HCTA, from Robt. Veiga, M.D., Dir., Medicine Staff, Office of Health Affairs, FDA. RE: Reuse of Hemodialyzer devices. "This is in response to your request of April 9, 1986 [SEE ENTRY ABOVE]. All information concerning the issue of reuse of [dialyzers], blood lines, transducer filters and dialyzer caps is already available to OHTA as part of the package perpared for the Senator Heinz hearing. The Office of Device Evaluation has no additional information. ." [NOTE: SEE

	5/10/86 ENTRY ABOVE ON BEGINNING OF FDA ESTABLISHMENT INSPECTION OF INFECTION OUTBREAK IN CALIF.; ALSO, SEE 6/25/86 ENTRY BELOW ON MEMO TO NCHSR/HCTA FROM FDA CONCERNING INFECTION OUTBREAKS "OVER THE PAST COUPLE OF MONTHS."]
5/30/86	36 year old male dialysis patient at a Georgia clinic suffers "serious adverse . . pyrogenic reaction" during dialysis with dialyzer reprocessed with Renalin.
6/2/86	At two Georgia clinics, three dialysis patients ranging from 46 to 72 years of age suffer "adverse reactions" (including two cases of septicemia) and are hospitalized after being dialyzed with reprocessed dialyzers.
6/2/86	Incident of bacteremia at Dallas Kidney Disease Center. "Patient involved with incident of bacteremia . . in association with reuse of dialyzer reprocessed with disinfectant. Patient recovered." [MDR received by FDA 6/10/86].
6/2/86	Draft LTTR from John J. Murphy, M.D. and Steven L. Solomon, M.D., CDC, to Geraldine Flynn, R.N., Administrator, Community Dialysis Services of Inglewood [Calif.]. ". . [regarding] the investigation of a cluster of cases of bacteremia which occurred recently at Community Dialysis Services . . [t]his letter is a summary of the preliminary results from that investigation . . Cases of intradialytic bacteremia were significantly more likely to occur among patients being dialyzed on cellulose acetate (CD-4000) dialyzers than among patients being dialyzed on other dialyzer types . . Patients diagnosed with intradialytic bacteremia had a significantly higher number of dialyzer reuses than control patients dialyzed at the same time with the same dialyzer type . . We are continuing to investigate the practice of reuse of disposable dialyzers as a source of potentially preventable nosocomial disease . . Recommendations . . [i]tems or devices that cannot be cleaned and sterilized or disinfected without altering their physical integrity and function should not be reprocessed." [NOTE: THIS 6-7 PAGE DRAFT LETTER WAS APPARENTLY LATER SHORTENED TO A ONE PAGE LETTER TO MS. FLYNN DATED JUNE 26, 1986. THE 6/26/86 LTTR TO FLYNN HAD ATTACHED TO IT THE MMWR ARTICLE, WHICH OMITS THE FINDINGS UNDERLINED ABOVE; SEE ALSO ALL DRAFTS OF MMWR ARTICLE, AS THE 6/2/86 DRAFT MAY BE THE EARLIEST DRAFT OF MMWR ARTICLE.]
6/3/86	53 year old female dialysis patient at a Georgia clinic suffers "adverse reaction" during dialysis session involving reprocessed dialyzer.
6/4/86	Letter from Stephen Heyse, M.D., NIDDKD, NIH, to Itzhak Jacoby, Acting Director, Office of Medical Applications of Research, RE: Reponse to request for information and advice about the safety and clinical effectiveness of the reuse of dialyzers, blood lines, transducer filters, and dialyzer caps labeled for "single use only". "[The 'Multiple Use of Hemodialyzers' study]***was an in vitro evaluation of the procedures used in processing hemodialyzers for reuse in terms of their retention and function, disinfection, cleanliness, and storage. The final report***concluded that 'utilization of the specified procedures with suitable process and quality control will result in a reprocessed hollow fiber hemodialyzer equivalent in terms of function, cleanliness, and sterility to a new hollow fiber hemodialyzer.' Although widely cited, this conclusion has remained controversial.***There have not been many reports of complications due to reuse of hemodialyzers which suggests that the practice is reasonably safe."

6/4/86	Incident of bacteremia at Dallas Kidney Disease Center. "Patient involved with incident of bacteremia . . in association with reuse of dialyzer reprocessed with disinfectant. Patient recovered."
6/4/86	Beginning date of FDA's reinspection of the Alcide Corp., manufacturer of RenNew-D. The FDA inspector returned to the firm to "collect" a new "Technical Bulletin" better explaining the use of the product. The bulletin was still in draft form. [NOTE: SEE FDA EIR.]
6/5/86	Incident of bacteremia at Dallas Kidney Disease Center. "Patient involved in incident of bacteremia following use of product in association with reuse of dialyzer reprocessed with disinfectant. Patient subsequently expired." [MDR received by FDA on 6/10/86].
6/6/86	Aging Committee staff learned that the NCHSR/HCTA "assessment" report would be completed and sent forward.
6/9/86	Senator Heinz filed comments with the NCHSR/HCTA in response to notice in the 4/10/86 Federal Register announcing the NCHSR/HCTA "Assessment of Technology: Reuse of Hemodialysis Devices Labeled For 'Single Use Only'," including the 3/6/86 hearing record and all related internal DHHS documents appended to the record. [NOTE: 6/9/86 WAS THE DAY BEFORE THE NCHSR/HCTA DEADLINE FOR THE PUBLIC TO FILE COMMENTS;]
6/9/86	**Telecon** between J. **Michie** and Dr. John **Marshall**, Dir., NCHSR/HCTA (Michie called). Michie informed Dr. Marshall that Senator Heinz was filing comments today on the "assessment". Marshall confirmed that the "draft report" was scheduled to be sent forward tomorrow. When Michie asked Dr. Marshall if he was aware of the latest infection outbreaks, Dr. Marshall said he was not.
6/9/86	Entry in the log (of Dr. Steven Solomon?), Hospital Infections Program, CDC. "John Murphy spoke [with] Dr. Parker [at the Dallas dialysis clinic, and was informed that] he has 5 cases of bacteremia, has been using [RenNew-D] since Dec."
6/10/86	Entry in log of (Dr. Steven Solomon?), Hospital Infections Program. "Spoke with Marie Reid [CDRH, FDA] in AM re: Dallas, Tx. & plans for MMWR. [NOTE: SEE 6/23/86 ENTRY BELOW RE: DRAFTING OF MMWR.]
6/10/86	FDA's Boston District Office recommended a "recall" of RenNew-D (a disinfectant used in reprocessing) following "problems" with the chemical reported in four different dialysis centers [NOTE: SEE UNDATED ENTRY BELOW; ALSO, GET COPY OF THE BOSTON DISTRICT RECOM.].
6/10/86	NOTE TO FDA Commissioner Young from John Villforth, Director, CDRH, FDA. ". . [Because of the initiatives of Senator Heinz,] the issue of dialysis reuse has become a high visibility one. . [W]e continue to stand firm on the position enunciated at the [MARCH 6] hearings and reiterated in Secretary Bowen's April 29 letter to Senator Heinz--that is, to date, we consider reuse to be a matter of medical practice and outside of FDA's regulatory purview. Further, in the absence of evidence of a public health hazard, we believe it is inappropriate to subject reprocessors to GMP controls, particularly in view of the concomitant enforcement costs."
6/10/86	Memo to Under Secretary Newman from Acting Asst. Sec. for Health McDonald (drafted by Marshall). RE: Reuse of Hemodialysis Devices. "... At the [March 6] hearing, Dr.

Marshall agreed to conduct an assessment [which] will be completed on June 10. . NCHSR/HCTA [headed by Dr. Marshall] has found no evidence contradictory to the position we took in testimony. . The literature does not suggest the need for clinical trials." [NOTE: PREPARED BY JOHN MARSHALL ON 6/6/86]

6/11/86 Personnel from the FDA Dallas, Tex., District Office and from CDC (Dr. John Murphy) began an investigation of infection outbreaks (8 reported cases) at the Dallas Kidney Treatment Center. "Dr. Murphy . . determined that four of the eight cases definitely fit the requirements [for infection] and that one case was questionable. ." From 6/12/86 through 6/16/86, Dr. Murphy determined that three additional patients had contracted infections. Following this second outbreak, the Clinic stopped using RenNew-D as the disinfectant in reprocessing and returned to using formaldehyde. [NOTE: SEE 6/17/86 MEMO FROM ARTIS M. DAVIS, CSO, DALLAS DISTRICT, FDA, TO THEODORE L. ROTTO, DIRECTOR, INVESTIGATIONS BRANCH, DALLAS DISTRICT, FDA; ALSO, SEE 6/13/86 MEMO TO FILE FROM H. FRANK NEWMAN, M.D., REGIONAL MEDICAL OFFICER, FDA; SEE ALSO 6/10/86 MDR ENTRY, ABOVE.]

6/(11)/86 Alcide Corp. issued a voluntary recall on the disinfectant RenNew-D following infection outbreaks in Fla., Cal., and Tex.

6/11/86 MEMO to Acting Deputy Administrator Desmarais, HCFA, from FDA Commissioner Young. RE: Desmarais' draft briefing paper (SEE 6/24/86 ENTRY BELOW). ". . While we agree that the current [NCHSR/HCTA assessment] of reuse may yield information that is both relevant and useful to our deliberations over whether to [regulate reprocessors], we are concerned about giving too much weight to our own tri-state survey, since its focus is on hemodialysis problems across-the-board and not solely on reuse. . Departmental action [should] be deferred until internal FDA deliberations on all regulatory options are completed. ." [NOTE: SEE 5/85 ENTRY ABOVE ON TRI-STATE SURVEY.]

6/12/86 Entry in log (of Dr. Steven Solomon?) Hospital Infections Program, CDC. "Spoke with Marie Reid [CDRH, FDA] about MMWR article.

6/13/86 MEMO to James M. Hughes, M.D., Director, Hospital Infections Program (HIP), CDC, from Steven L. Solomon, M.D., Assistant Chief, Epidemiology Branch, HIP, CDC, through William J. Martone, M.D., Chief, Epidemiology Branch, HIP, CDC. RE: Bacteremia associated with reprocessing of dialyzers. " . . During the week of May 12, 1986 we learned . . Alcide Corporation had filed an MDR report regarding an investigation they had conducted at a hemodialysis center in Florida [see entry of 4/3/86, above] . . between March 24 and April 1, 1986 there had been seven patients at CDS-Daytona who had experienced adverse reactions during hemodialysis . . On May 27, 1986 Dr. Murphy and I contacted Mr. Jerry Bryant at [the clinic headquarters]. Mr. Bryant was aware of the problems in California and Florida, and indicated that there were either five or six CDS centers currently using Alcide [RenNew-D] in a comparison trial with other CDS center which were using Renalin * * * We now have information suggesting the occurrence [of] five clusters of adverse reactions among patients undergoing maintenance hemodialysis at four different hemodialysis centers which were using Alcide [RenNew-D] for reprocessing of disposable dialyzers. In all five instances representatives of the Alcide and/or Cobe Companies conducted investigations prior to the involvement of local, state, or federal health officials. In at least three of the five instances notification of FDA by representatives of the Alcide Corporation occurred after involvement of Alcide/Cobe representatives have come to light through other means. In at least one instance specimens obtained by Alcide/Cobe representatives were reportedly handled in a manner that rendered them inappropriate for testing."

6/13/86 Letter to John Heinz, Chairman, Special Committee on Aging, from Bartlett S. Fleming, Associate Administrator for Management and Support Services. RE: "***Actions taken by***HCFA relative to the first panel of witnesses who testified at the dialyzer reuse hearing. Ms.McFadden's case appears to have been resolved. ***Ms. McFadden reported that the center has a new patient Bill of Rights, that patients are being informed about BMA's grievance procedures. ***[The] Atlanta Regional Office will investigate Mr. Vogter's case***during the early part of June 1986. ***Malcolm Schuman, surviving son of Baton Rouge dialysis patient, Elaine Melville Schuman did not voice any specific concerns***which required***HCFA investigation. ***A complaint investigation was conducted at BMA Central Philadelphia***in response to allegations which Mr. Rosen previously shared with HCFA. ***This investigation revealed one Federal deficiency concerning the center's official policy and procedure manual not including a segment on the rules and regulations governing patient responsibilities and conduct. The deficiency was subsequently corrected. ***Though **HCFA's policy** has always been that the decision to reuse is a medical practice issue, which should be decided by a patient's physician, **we do not, and will not, tolerate facilities which force their patients to reuse at the risk of being denied treatment.** We will continue to monitor ESRD facilities ***and will investigate all patient complaints." [NOTE: SEE 8/5/86 AND 8/15/86 HCFA MEMOS BELOW.]

6/16/86 61 year old female dialysis patient at a Georgia clinic suffers "serious adverse reaction . . [of] intradialytic sepsis" after dialysis session involving reprocessed dialyzer.

6/17/86 LTTR to Jan Graf, R.N., Clearwater, Fla., from Wally Jansen, V.P. Quality Assurance, Renal Systems Inc., manufacturer of Renalin, another disinfectant used in reprocessing. ". . The recent pyrogenic reactions at Brunswick and Jesop, Ga., Dialysis Centers do not appear to be related to the chemical. In the Brunswick center RO membrane failure. . was the most probable cause. At Jesop it is probable that the reactions were the result of other patient complications. . [The Brunswick] operation lacks a written document for reuse. . The current system relies on verbal instruction and the memory of the [reprocessing] technician. . "

6/20/86 LTTR to Enrique Carter, M.D., NCHSR/HCTA, from Gary Noble, M.D., CDC. ". . The Hospital Infections Program [at CDC] has the responsibility for performing surveillance of . . infection control strategies and disinfection and sterilization practices used in dialysis centers. . [T]he sensitivity of this surveillance system. . has not been assessed. . We have no data on the reuse of blood lines, transducer filters and dialyzer caps. To our knowledge, there are no guidelines or recommendations that extend to these devices. ."

6/20/86 MEMO of Meeting of representatives from FDA, CDC, Alcide Corp., and Cobe Laboratories, Inc. concerning problems with RenNew-D.

6/20/86	NOTE to FDA Commissioner Young from James Benson, Deputy Director, CDRH, FDA (drafted by Eccleston?). RE: an alert to an upcoming recall of RenNew-D. ". . [T]his case may draw more than its share of attention. . [S]taff from Sen. Heinz's Committee are cognizant of the situation. . The outbreaks [of infection] involved four dialysis centers (two in Cal., one each in Fla. and Tex.), each outbreak involving several patients. (There was one death, in Texas, but this was not directly attributable to the disinfectant.) CDC . . corroborated the link between the patient reactions and the disinfectant. ."
6/23/86	CDC FACSIMILE TRANSMISSION to Dr. Fernando Villaroel, CDRH, FDA, from Steven Solomon, M.D., CDC. RE: draft #1 of MMWR article, "Bacteremia Associated with Reuse of Disposable Hollow-Fiber Hemodialyzers." ". . Editorial Note: . . There are . . no controlled clinical studies validating the safety or assessing the risk to patients of the practice of the reuse of disposable hemodialyzers, nor are there controlled clinical studies comparing the morbidity and mortality of patients being dialyzed with new dialyzers with that of patients being dialyzed with reprocessed 'single use only' dialyzers. . There are . . no federal standards for ensuring the functional or microbiologic quality of 'single use only' hemodialyzers reprocessed in hemodialysis clinics. Until further information is available, CDC recommends that providers . . review their practices and experience and assess whether alternatives to one-time use of dialyzers are appropriate and optimally beneficial to patients." [NOTE: ALL OF THE ABOVE UNDERLINED WAS REMOVED FROM THE ARTICLE PRIOR TO PUBLICATION; SEE PUBLISHED VERSION IN HARD CHRON, DATED 6/27/86.]
6/24/86	Entry in log (of Dr. Steven Solomon?), Hospital Infections Program. "Conference call with FDA -- Ann Holt, Len Stauffer, Marie Reid [and] others." [SEE 6/23/86 ENTRY ABOVE RE: DRAFTING OF MMWR ARTICLE.]
6/24/86	MEMO to DHHS Under Secretary Newman from Executive Associate Administrator Desmarais, M.D., HCFA. RE: Reuse of Hemodialysis Devices. ". . No action should be taken until the Department has had an opportunity to review the results of the [NCHSR/HCTA] assessment information and the FDA completes its internal deliberations on the regulatory options available."
6/24/86	FDA (Marie Reid) and CDC (Steven Solomon) began to collaborate on the text of the CDC's MMWR (alert) article on infection outbreaks involving RenNew-D. [NOTE: FDA was successful in getting CDC to change the text of the article and not focus on the need for clinical trials in dialysis clinics--SEE DRAFTS #2 AND #4, AND SEE FINAL TEXT OF ARTICLE; ALSO, SEE 6/25/86 NOTE TO FDA COMMISSIONER BELOW.]
6/25/86	NOTE to FDA Commissioner Young from James Benson, Deputy Director of CDRH, FDA (drafted by Eccleston). RE: CDC's MMWR article on infection outbreaks. ". . In my last note, I alluded to CDC's intent to issue an MMWR article on [the infections] problem. . Our staff has been in contact with both the authors of the article and review officials to suggest some changes to bring it in line with the statements about dialysis reuse made by Dr. John Marshall and John Villforth at the [Heinz] hearings on this subject this past March. . Finally, you should be aware that staff from Senator Heinz's Aging Committee are taking an active interest in this Alcide issue. . [I]t's possible that additional hearings might be held. If new hearings were to come about, it's likely that Senator Heinz would use the

	Alcide problem as a 'case study' to exert more pressure on FDA to apply regulatory controls to reprocessors. . "
6/25/86	NOTE to Alan Anderson, FDA, from David West, CDRH, FDA. RE: the need for microbiology laboratory support for the regulation of antimicrobial agents (disinfectants used in reprocessing).
6/25/86	MEMO to John Marshall, Director, NCHSR/HCTA, from James Benson, Deputy Director, CDRH, FDA. RE: recall of Hemodialysis Disinfectant (RenNew-D). ". . Over the past couple of months, we have become aware of outbreaks of pyrogen-like reactions and/or bacteremia in patients . . dialyzed with membranes. . disinfected with RenNew-D. The outbreaks involved four centers. . On-site inspections. . corroborated the link between the patient reactions and the disinfectant. . RenNew-D solutions were not holding their potency beyond 24 hours. . " [NOTE: SEE 5/10/86 ENTRY ABOVE ON BEGINNING OF FDA ESTABLISHMENT INSPECTION OF INFECTION OUTBREAK IN CAL.; ALSO, SEE 5/28/86 ENTRY ABOVE ON MEMO TO NCHSR/HCTA FROM FDA STATING THAT THERE WAS NO NEW INFORMATION TO REPORT SINCE THE 3/6/86 AGING COMMITTEE HEARING.]
6/26/86	MEMO (Hand-written) to Device Complaint Coordinator, FDA, from Marie Reid, CDRH, FDA. RE: pyrogenic reactions to the disinfectant Renalin at two Georgia dialysis clinics. [NOTE: SEE ENTRIES FOR 5/30/86, 6/2/86, 6/3/86, 6/16/86 AND 6/17/86 ABOVE.]
6/(27)/86	MEMO to FDA's Boston District Office (SEE 6/10/86 ENTRY ABOVE) from Leonard Stauffer, FDA's Recall & Notification Branch. RE: problems reported in four different dialysis centers that used RenNew-D in reprocessing. ". . [T]here appears to be considerable confusion regarding the cause of the problems. . [T]here may be other problems, e.g. the disinfectant solution may adversely affect the dialyzer membranes through repeated use. . [C]ontinued use of RenNew-D presents a substantial unreasonable risk to health. We recommend that all RenNew-D consignees be immediately notified to stop using the product until the problem is resolved. ."
6/27/86	LTTR to Device Monitoring Branch, CDRH, FDA, from Leroy Fischbach, V.P. Regulatory Affairs, Renal Systems, Inc., manufacturer of Renalin. "on June 6, 1986, Renal Systems received a complaint from Ms. Jan Graf, R.N., (SEE 6/17/86 ENTRY ABOVE) concerning patient pyrogenic reactions at two dialysis centers in Georgia. . [A]t least a portion of this complaint. . may fit into the category of a serious injury. ."
6/27/86	(Beginning date of) FDA Establishment Inspection at Renal Systems, Inc., Plymouth Minn., manufacturer of the disinfectant Renalin, which is used to reprocess dialysis devices. RE: serious deficiencies in reprocessing procedures at the dialysis centers in Brunswick and Jesop, Ga.; problems with quality control in the manufacture of the product; and failure of Renal Systems to file medical device reports (MDR's) with FDA concerning complaints from Middlesex Hospital, Middletown, Conn., and a center in Fort Worth, Tex. [NOTE: SEE FDA EIR, BEGINNING DATE--6/27/86.]
6/27/86	CDC's Morbidity and Mortality Weekly Report (MMWR) article, "Bacteremia Associated with Reuse Of Disposable Hollow-Fiber Hemodialyzers." [NOTE: SEE ENTRY ABOVE FOR BENSON 6/25/86 NOTE TO THE COMMISSIONER OF FDA.]
6/27/86	TELEPHONE CALL to Steven L. Solomon, M.D., CDC, from Robert Skufca, D.O., FDA, RE: a report of clusters of patient

illnesses occurring at two Georgia dialysis centers. (The reported illnesses were similar to those noted in the Calif. dialysis clinics, but involved a different disinfectant used for reprocessing dialyzers.) [NOTE: SEE HARD COPY OF 7/8/86 CDC MEMO BY SOLOMON AND HUGHES; SEE ALSO 7/8/86 ENTRY BELOW RE: DR. MURPHY'S DEPARTURE TO GEORGIA; AND 6/26/86 AND 6/27/86 ENTRIES ABOVE RE: LTTR TO FDA FROM MFR. OF RENALIN AND ESTABLISHMENT INSPECTION OF MFR.]

7/86 Draft Report Of The Reuse Committee, FDA; Options For The Managing Of Reuse Of Medical Devices (SEE 5/16/86 ENTRY ABOVE). ". . [T]he lack of reports [of problems] does not necessarily mean there are no problems associated with reuse. . The lack of literature citations and MDR and DEN reports could mean that problems associated with reuse either have not been recognized as being associated with reprocessing or reuse, or that they are just not reported. . [C]ost containment and not medical necessity is the prime reason for reuse. . [T]here is little information available on product durability, function, and safety of reprocessed medical devices. . [T]he responsibility to protect the public health . . requires that the [FDA] decide on a reuse policy. . "

7/1/86 INTEROFFICE MEMORANDUM to Wally Pellerite, FDA, from Dale Burke, FDA. RE: Summary of MDR reports for Dialysis Equipment Companies. ". . [A] search of the database to retrieve both MDA and PRP reports [produced] twenty-five reports involving three manufacturers. The reports refer to incidents of death, serious injury, and malfunction, and include, but are not limited to, disinfectant and sterilization components. . "

7/2/86 Note to Anna Boyd, Executive Secretariat, PHS(?), DHHS, from John Marshall, Ph.D., Dir., NCHSR/HCTA. RE: Reuse of Hemodialysis Devices - Tracer #92625. "***The PHS **assessment of** the risks and benefits [of] **reuse *** will be transmitted to** [HCFA] **on July 10.** The briefing material should note that the June 27, 1986 issue of [MMWR] *** contains [an] editorial note [which] states "Additional studies of the functional and microbiologic quality of reprocessed hemodialyzers, as we as the factors affecting their clinical safety, are needed to formulate guidelines." This view is contrary to the position taken in testimony on March 6, 1986. It is possible that staff of the Senate Special Committee on Aging will request an explanation for this discrepancy."

7/3/86 NOTE to FDA Commissioner Young from James Benson, Deputy Director, CDRH, FDA (drafted by Eccleston). ". . I want to bring your attention to a new problem involving another disinfectant [Renalin]. . [involving infections] at two clinics in southern Georgia. . [P]reliminary findings by the firm indicate that the problem can be traced to faulty plumbing. . In talking with CDC, we learned that staff from Senator Heinz's Aging Committee had already been in touch with them about the Renalin situation. . My intuition is that, taken together, the problems with Renalin and RenNew-D may well precipitate another round of Congressional hearings on the clinical safety of reuse. ."

7/8/86 MEMO to James Hughes, M.D., Director, HIP, CDC, from **John Murphy**, M.D., EIS Officer, HIP, and Steven L. Solomon, M.D., Assistant Chief, Epidemiology Branch, HIP, CDC, through William J. Martone, M.D., Chief, Epidemiology Branch, HIP, CDC. RE: **Epidemic** Aid **Investigation of Bacteremias** Associated with Reuse of Disposable Hemodialyzers. "We would like to propose the following plan for pursuing this epidemic investigation . . It is evident that the data base concerning the safety and appropriateness of reusing disposable hemodialyzers is currently inadequate to make a scientific assessment of whether or not this practice should be promoted, tolerated, or prohibited for public health purposes. Even if the practice is found to be safe (or even beneficial), there is an obvious need for standards addressing the manner in which reuse is performed. Such standards must be based on clinical trials and incorporate long-term assessments of patient outcomes using a variety of measures, including morbidity and mortality."

7/8/86 Memo, FOR ADMINISTRATION USE, LIMITED DISTRIBUTION, NOT FOR PUBLICATION, to James Mason, M.D., Dir. of CDC, from Drs. Solomon and Hughes, Hospital Infections Program, CDC. RE: Clusters of Bacteremia among [dialysis] Patients--Georgia. "On June 27, 2986, [Dr.] Solomon was called by Robert Skufca, D.O., Medical Officer, Office of Health Affairs, FDA, concerning a report of clusters of patient illnesses occurring at two dialysis centers. *** The FDA planned to conduct an investigation of the illnesses***It was agreed that Dr. Murphy would join FDA officials in their investigation***"

7/8/86 John J. Murphy, M.D. of CDC Hospital Infections Program, travels to the two Georgia dialysis clinics at Brunswick and Jesop to investigate clusters of bacteremia among dialysis patients.

7/8/86 Meeting (requested by NCHSR/HCTA) with DHHS Assistant Secretary for Health Dr. Robt. Windom, his deputy, Steve Grossman, Robert Eccleston of FDA, Hanns Kuttner of DHHS, Valery Swetlow, PHS, James Benson of FDA, Lawrence Kobren of FDA, Dr. John Marshall of NCHSR/HCTA, Dr. Enrique Carter of NCHSR/HCTA, Martin Erlichman of NCHSR/HCTA, and Dr. Martin Favero of CDC. RE: the findings of the NCHSR/HCTA's "assessment", and discussion of a 7/8/86 briefing memo (see entry below) to Dr. Windom from Dr. Marshall. According to the NCHSR/HCTA attendees and L. Kobren of FDA, Dr. Grossman asked that all copies of the Marshall memo be pulled back and disposed of. According to Dr. Carter, Grossman scolded Marshall for having written the memo in the first place. [NOTE: SEE 7/11/86 "NOTE TO THE COMMISSIONER" BY BENSON IN HARD CHRON FILE]

7/8/86 Memo to DHHS Assistant Secretary for Health Dr. Robt. Windom from NCHSR/HCTA Director Dr. John Marshall. RE: Hemodialyzer Reuse. ". . The involvement of NCHSR is only recent, but NIH, FDA and CDC have had a long but non-productive involvement in these issues. [I]t is clear that [my] March 6 testimony [before the Aging Committee] was not based on all of the germane facts and that we may need to take a position counter to that which we argued on March 6. We need to ascertain a PHS position and inform HCFA of that position so as to minimize embarrassment for the Department. . In the course of carrying out [our] assessment, it has become evident that communication within the Public Health Service is less than adequate. We uncovered serious omissions and inaccuracies in the testimony which had been prepared based on the facts made available last March. Some of these only came to light the day before the comment period for the assessment expired, when we received several hundred pages of information from Senator Heinz. Included in that were internal PHS documents that had not previously been shared with us. On the strength of that, I requested an extension to July 10 for completing our report. However, the recent outbreaks of bacteremia [infections], and additional information that has unfolded from that process, suggest that a report at this time might not be appropriate. . The PHS needs to take a clinically and scientifically based stand with respect to this issue. We need to communicate that directly and emphatically to the Health Care Financing Administration, even if that means recognizing that our earlier testimony was flawed."

7/8/86 Memo to (? ? ?) from Marie, Reid. R.N., CDRH, FDA. RE: Inspection of Manufacturers of Disinfecting Solution for Reuse of Dialyzers. ". . Recent complaints filed in the DEN/MDR database indicate that the use of disinfectants to reprocess hemodialyzers have been associated with 'pyrogenic reactions' and 'pseudomonas bacteremia.' The problem of sepsis . . is a major concern to the [CDRH] at this time. . Please conduct a top priority inspection of the manufacturers listed . ."

7/10/86 NOTE to Bob Rickard [Office of ASH] from Anne Desmond [also? Office of ASH], Subject: Hemodialysis. " . . You asked us to talk with Anna Boyd about notifying [the Office of the Secretary of HHS] of the delay in the assessment of dialysis reuse . . she agreed that a 'general' memo to the Secretary would be appropriate. It is attached for your clearance . . Anna also asked that we . . [a]sk John Marshall if he has kept Bill Roper or Henry Desmarais informed of the progress of his study. (HCFA is proceeding with a new End Stage Renal Disease Program reg, that will reduce reimbursement rates for kidney dialysis; obviously, if that happens, dialysis centers will want to shift to even more dialysis filter reuse, since its cheaper. Therefore, if John Marshall reaches conclusions that reuse is a health hazard, it could put the HCFA folks in a quandary [sic] . . Anna had heard about some problems with disinfectants used in dialyzer reprocessing, and about the disagreement between NCHSR and CDC on whether more study is needed on the microbiologic quality of reprocessed filters. She asked us to call her with more information on that, for her edification."

7/14/86 Lttr to DHHS Secretary Bowen from Senator Heinz. RE: request for documents (post-March 6 hearing) from NIH, FDA, CDC NCHSR, etc., including a specific request for the Marshall memo of 7/8/86 [NOTE: SEE ENTRY ABOVE.]

7/14/86 Memo to DHHS Secretary Bowen from Assistant Secretary for Health Windom. RE: Reuse of Hemodialysis Devices. ". . Several intervening factors have delayed completion of the [NCHSR/HCTA assessment] report. On the last day of the comment period, Senator Heinz submitted a voluminous amount of new material . . Subsequently, there have been several outbreaks of bacteremia . . I have directed NCHSR to develop . . a series of recommendations . . I have asked that the assessment be completed by mid-August. As soon as I have reviewed it, I shall advise you of its findings.?

7/18/86 Lttr to DHHS Secretary Bowen from Senator Heinz. RE: recent outbreaks of infection in dialysis clinics. "In light of these recent incidents, I again urge you to immediately impose the GMP's on reprocessors of dialysis devices in the interest of protecting the health and safety of dialysis patients."

7/18/86 Letter to Michael Jhin, Executive Director, Temple University Hospital, Renal Dialysis Facility, from Robert Taylor, Associate Regional Administrator, Health Standards and Quality, HCFA. Dialysis patient had been told not to report ot his regular facility, after an altercation with his physician. Instead, he had to receive treatment at local hospitals, on an emergency basis. "***These treatments have been given only after intervention by staff from Sen. Heinz's office***[The patient] has received treatment only when he has been on the brink of being completely overcome by the effects of his disease.***[The facility's] actions, with respect to [the patient], is imcompatible with the patient's rights and responsibilities Condition for Coverage which must be met in order to remain in the Medicare program***It is basically indensible to place him in the position of not knowing where his next dialysis treatment will come from***We are deeply concerned that a patient, who has been receiving chronic dialysis treatments on a planned schedule, is thrust into a regimen in which he must be in acute distress before receiving treatment. Such action, ***is a clear violation of the [regulations]."

7/23/86 Lttr to DHHS Secretary Bowen from Senator Heinz. RE: NCHSR/HCTA Director John Marshall's 7/8/86 memo [SEE ENTRY ABOVE) to DHHS Assistant Secretary for Health. "This alarming and shocking memorandum reveals all too clearly a severe breakdown in communications and coordination among the agencies responsible for the safety and well-being of dialysis patients . ."

7/25/86 **CONFIDENTIAL** note to Frank Young, M.D., FDA Commissioner. "*** While there are few words or phrases in my 8 July memo to Dr. Windom which in retrospect might better have remained not used, the summary of events and attitudes is accurate. I am comfortable with the testimony to the extent that I do not believe there is evidence that patient safety has been seriously compromised. Neither is there evidence of widespread adverse events. The question is whether we are doing enough to continue to protect patients as dialyzer reuse becomes more frequent, as dialysis centers attempt to cut costs, and as more centers reprocess with disinfectants other than formaldehyde in response to the concerns of patients and staff. A list of documents currently in our files is attached, as we discussed. The items marked in yellow are those which have only recently been brought to our attention. Not all of them involve FDA and clearly not all are significant. But some are, and they should have been shared earlier. More important are other documents which still have not been discussed with us. Chief among these are trends or preliminary results from the several State survey contracts. I'm available to discuss any of this further at your convenience."

7/28/86 Final Version, Recommended Practice for Reuse of Hemodialyzers, Association for the Advancement of Medical Instrumentation. Note that the guidelines do not address the reuse of blood lines and tubing, dialyzer caps and transducer filters. "This recommended practice does not cover the reprocessing of blood tubing sets."

7/29/86 . Memo to Dr. James Mason, Dir., CDC, from Favero, Chief, Nosocomial Infections Laboratory Branch, Hospital Infections Program, CDC. RE: Reuse of Hemodialyzers. ". . In 1976, CDC collaborated for the first time with HCFA in performing surveillance of dialysis-associated diseases. [In 1977] CDC collaborated with the Renal Physicians Association (RPA) in examining . . reuse . . with respect to risk of hepatitis B infection and pyrogenic reaction. There was no difference in the incidence of . . pyrogenic reactions and septicemia among patients in centers that reused . . In surveys conducted in succeeding years through . . 1985, the same results have been obtained. . In 1982, CDC investigated an outbreak of . . infections in Louisiana. . [D]ata showed that . . 2% formaldehyde was inadequate to kill [the bacteria]. . [T]he recommendation was made that . . at least 4% formaldehyde should be used. . [CDC] also recommended that centers . . consider using one of several newly developed [chemicals]. These recommendations were made in several scientific publications and, although never formally published in an MMWR article or as an official CDC guideline, are perceived among the dialysis community as CDC recommendations. . Preliminary results of [recent infection outbreaks in several clinics] were reported in the [**MMWR**] of June 27, 1986. The suggestion in the Editorial Note of the need for future studies was discussed with Dr. John Marshall, Director, [NCHSR/HCTA], who concurred with the final version prior to publication. . I participated in a telephone conference two days prior to the [March 6] hearings, and answered questions Dr. Marshall had about the material that was sent to him from CDC. ."

8/1/86 MEMO to Director, CDC from Hospital Infections Program, CDC, RE: Bacteremia Associated with Reuse of Disposable Hollow-Fiber Hemodialyzers, Georgia. ". . the most likely source of the infections appears to be reprocessed hemodialyzers . . [o]n June 27, 1986, [CDC] was called . . concerning clusters of patient illnesses occurring at two dialysis centers * * * both centers used a 40:1 dilution of [disinfectant] concentrate with product water, while the recommended dilution specified on each bottle of the concentrate is 24:1 . . the apparatus used for rinsing and filling of the hemodialyzers . . may have allowed for additional dilution of the prepared [disinfectant] solution prior to its entry into dialyzers. Due to the fact that use of Renalin had been discontinued prior to CDC participation in this investigation, and that the apparatus which had been used for processing dialyzers . . had been disassembled, we were unable to verify whether or not this additional dilution had actually taken place.

8/2/86 Lttr to NCHSR/HCTA Director Dr. John Marshall from James F. Michie, Chief Investigator, Aging Committee. RE: transmittal of documents on infection outbreaks, which had not been provided to NCHSR/HCTA by its sister agencies for the assessment on reuse of dialysis devices.

8/4/86 Entry in log (of Dr. Steven Solomon), Hospital Infections Program, CDC. "4:30 mtg [with] Dr. [John] Bennett [Asst. Dir. for Medical Science, Office of the Dir., Center for Infectious Diseases, CDC,] to discuss our response to request from Dr. Marshall's office transmitted thru Ms. DePeyster for CDC policy on use of formaldehyde. Bill Martone [Chief, Epidemic Infections Branch, Center for Infectious Diseases, CDC,] attended.

8/4/86 Entry in log (of Dr. Steven Solomon), Hospital Infections Program, CDC. "5:00 pm conference call to Dr. Enreque Carter (Martin Erlichman) with Bill Martone and John Murphy. CDC policy: ref to June 27 MMWR -- "Additional studies needed to formulate guidelines -- **no data on whether reprocessing with formaldehyde or other disinfectant is better, equal to, worse than single-use only**; however 4% formaldehyde appears better than 2% formaldehyde."

8/5/86 Memo to Acting Director, Office of Survey and Certification, HCFA, from Robert J. Taylor, Associate Regional Administrator, Division of Health Standards and Quality, Region III, HCFA. RE: Issue regarding reuse of the hemodialyzer and blood lines used for kidney dialysis treatment-Enforcement of applicable federal regulations. "Please refer to [the June 13, 1986 letter to Senator Heinz from Bartlett Fleming, Associate Administrator for Management and Support Services, HCFA] which states, 'Though **HCFA's policy** has always been that the decision to reuse is a medical practice issue, which should be decided by a patient's physician, **we do not, and will not, tolerate**

facilities which 'force' their patients to reuse at the risk of being denied treatment.'***[According to the Washington, D.C. state agency, a dialysis] facility has indicated to patients that they will assist them to transfer to other renal dialysis units if they elect not to use reused blood lines. Patients are required to respond within thirty (30) days receipt of the notification. We do not feel that the above represents appropriate justification for transfer of patients. Are we prepared to take the position that we will terminate providers who force patients to reuse blood lines and hemodialyzers by giving them no choice except to transfer to another provider if available?" NOTE: SEE 6/13/86 HCFA LETTER TO SEN. HEINZ ABOVE; ALSO, SEE 8/15/86 HCFA MEMO BELOW.]

8/5/86 **Telecon** between J. **Michie** and John J. **Murphy**, M.D., Officer and Investigator, Epidemiology Investigations Service, Hospital Infections Program, CDC (Michie called Murphy). "I was involved in the Inglewood, Cal., and Dallas, Tex., inspections. I learned about the problems at the Dallas clinic only by accident, when I telephoned Dr. Parker at that clinic to consult with him about the Cal. outbreak because of his long experience with reuse. During the conversation, Dr. Parker revealed that his clinic had had similar infections after it had begun to use RenNew-D. I was not involved in the inspections of the Fla. clinic, the 2nd center (Napa Valley) in Cal., and another Fla. clinic. FDA took care of those. I also inspected the two Ga. clinics, from 7/9 to 7/11, but have not finished my report. The Ga. clinics involved use of Renalin. They switched back to Formaldehyde. We have the feeling that reuse is not really safe, but we don't have enough data to back it up. It's possible the death in Dallas was related to the dialysis problem, but I couldn't prove it. The MMWR article was written rapidly. Although we did not specifically recommend controlled clinical studies, we do believe these studies are necessary, and we intend to recommend them. We plan to put a protocol together."

8/5/86 **Telecon** between J. **Michie** and Steven **Solomon**, M.D. (Dr. Murphy's superior), Hospital Infections Program, CDC. "My personal interpretation of the MMWR article is that it means controlled clinical trials, but I can't represent this as the CDC's or the DHHS's position. CDC and FDA co-authored the 6/27 MMWR article." [SEE NOTEBOOK #25]

8/6/86 Memo to DHHS Assistant Secretary for Health Windom from NCHSR/HCTA Director Marshall. RE: Hemodialyzer Reuse [Report on the NCHSR/HCTA's assessment of reuse was attached]. "While the current information does not provide evidence that multiple use is without hazard, neither does it demonstrate sufficient grounds to abandon reuse. We have determined that there are potential hazards associated with reprocessing of dialyzers, blood lines and tubing, filter caps, and transducers; that long term effects of the disinfectant used in reprocessing need to be better understood; and that there is insufficient patient education material to assist patients in making an informed consent for dialyzer reuse. There is a need to take steps to assure that facilities choosing to reuse observe practices consistent with optimal patient safety and clinical effectiveness. . It is incumbent on the Public Health Service to identify and to publicize the optimum practices for assuring safety and quality. It is our further responsibility to provide advice to HCFA, but ultimate responsibility for the End-Stage Renal Disease program lies with that agency."

8/7/86 **Telecon** between J. **Michie** and Martin **Favero**, Ph.D., Hospital Infections Program, CDC (Michie called). "Dr.

Murphy told me he was convinced that, based on the lab records and the fact that the patient did not fit the infection outbreak, the patient who died in Dallas suffered from a shunt infection. My personal opinion is that dialysis clinics should be looking for an alternative to formaldehyde as a disinfectant for reuse. The recommendation to use 4% formaldehyde in reuse is not an official recommendation of CDC. I was in Paris after the first draft of the 6/27 MMWR article was sent to FDA for comment. I had no problems with the first draft of the MMWR article. I don't think there is a need for clinical study. There is a need for quality control, but FDA is not doing a good job in this area." [NOTE: SEE 8/5/86 ENTRY ABOVE ON MICHIE/MURPHY TELECON.]

8/7/86 Lttr to DHHS Assistant Secretary for Health Windom from Senator Heinz. RE: request to Windom to provide NCHSR/HCTA with more time to complete its assessment so that the agency can review documents provided by Senator Heinz.

8/8/86 Lttr to NCHSR/HCTA Director Dr. John Marshall from Senator Heinz. RE: transmittal of FDA Establishment Inspection Reports (EIR's) which FDA had not provided to NCHSR/HCTA for its assessment of reuse of dialysis devices.

8/11/86 Memo to Wm. Roper, M.D., Administrator, HCFA, from Robt. Windom, M.D., Asst. Secretary for Health, DHHS. RE: Reuse (attachment--NCHSR/HCTA reuse assessment report). ". . The findings to date indicate that when [appropriate quality control is exercised], patient outcomes appear to be no different in facilities that reuse dialyzers than for those facilities where single use is the normal operating mode. While there is evidence of a relationship between improper reprocessing and outbreaks of bacteremia/sepsis, these appear to represent isolated events. The absence of reported increases in the morbidity and mortality given increased practice of reuse suggests that virtually all facilities are following adequate procedures. The assessment also found variation in the reprocessing practices and concludes that the need exists for further study . ." [NOTE: SEE 7/8/86 MARSHALL MEMO ABOVE; ALSO, SEE 8/6/86 MEMO FROM MARSHALL TO WINDOM ABOVE.]

8/12/86 Lttr to Claudia Woodring, Contracting Officer, FDA, from James Barquest, Ph.D., California Department of Health Services. RE: draft final report "California Dialysis Facility Study" performed under FDA contract. [Note: Study is based on site visits and "oral and written information voluntarily provided" by 31 dialysis centers in California. See also 5/86 entry on D.C. study above] Excerpts:
"Water Treatment Section: . . Conformance with [water treatment equipment] label requirements was found to be minimal . . [including] failure to . . ensure that [water treatment] units regenerated off-site are free of industrial contaminants and are disinfected prior to being placed in service [P. 9]* * * "
"Personnel Section: . . Five facilities have . . a separate job classification for reuse. The reuse technician's responsibility is to reprocess dialyzers and to maintain reuse equipment. Educational requirements for this position, when specified, were minimal. For example, one facility's requirement was that the person be at least 16 years of age and be able to read and write English [P. 19]
* * * "
"Reuse of Disposables Section: . . All dialysis facilities appeared to be satisfied that they were providing safe and effective reprocessed dialyzers . . However, the observation that facilities are frequently not adhering to their protocols, and the general lack of quality control and assurance procedures indicates that at least some of

the reuse programs are not operating in a state of control [P. 31] * * * Formaldehyde is the disinfecting agent of choice at the sites visited. The median concentration used appears to be in the two percent to three percent range. Many of the facilities were unable to indicate the concentration of formaldehyde used in the disinfection process [P. 34] . . Among all the quality control procedures for reuse that were observed in the sites visited, the testing for the amounts of formaldehyde disinfectant residual was the worst . . It was felt that the depth of understanding of the principles associated with disinfectant chemical testing was seriously lacking among reprocessing technicians performing this crucial quality control test . . Whatever the standard [for residual disinfectant tolerated in the dialyzer] employed by the facility, specifying a test suitably sensitive to the standard . . is mandatory. Again, this was something seriously lacking at the sites observed [P. 36] * * * facilities indicated that there were hypersensitivity reactions thought to be caused by the formaldehyde disinfectant residual. Dialyzer mix-up is a labeling control problem which has occurred sporadically [P. 37] . . One facility indicated several pyrogenic and septicimic responses directly attributable to the reuse process. It was found that procedures for diluting the formaldehyde chemical [37% formaldehyde] into the useable 1.5% . . solution were incorrect. Tests revealed that the actual concentration of the formaldehyde solution approximated 0.5 percent allowing for bacterial growth in both the disinfectant chemical storage container and, apparently, in the patient dialyzers themselves . . Arterial blood lines were reprocessed at two facilities . . the same as for the hollow fiber dialyzers. No testing for disinfectant residuals was indicated by the facilities [P. 38] * * * "
"Problem Experience Section: . . Five of the twelve water system problems were due to water system 'dead spots' resulting in the inability to adequately disinfect the system or rinse formaldehyde from the system after disinfection [P. 39] . . Problems of the nature reported for water systems can be prevented . . the ability to disinfect and clear the system of disinfectant residual are major system considerations; yet, problems in these areas frequently occur [P. 40] * * * "
"Labeling Section: . . water system vendors such as Continental, Culligan, and Arrowhead Industrial Water were responsible for installing the majority of water treatment equipment in the subject dialysis facilities, yet do not appear to be regulated as medical device manufacturers subject to Good Manufacturing Practice controls and medical device labeling requirements. Water for dialysis . . can profoundly impact the quality of care. It seems reasonable that equipment used to produce water for dialysis be required to meet the same standards of quality and design as the other devices used in the delivery of hemodialysis treatment. [P. 44]"

8/12/86 Briefing Book prepared for Robert Windom, M.D., Assistant Secretary for Health, PHS (apparently in preparation for the hearing proposed by Sen. Heinz for 8/15/86). "4:00 PM -- 716G/HHH. Participants: Windom, Grossman, Zucker, Mara, Marshall, Carter, Erlichman, and FDA (Benson, Eccleston & technical staff). [BOOK CONSISTED OF A TWO-PAGE "EXECUTIVE SUMMARY" AND TABS A THRU F]
"Executive Summary: *** There are several points to bear in mind: *** [bullet #6] CDRH has sponsored a study in which health departments in D.C., Calif, Mass. & Ohio canvased dialysis clinics to assess problems with hemodialysis across-the-board. The final D.C. report and draft reports from two states have found no problems with reuse. (study started in October 1984. $300K). *** [bullet #8] CDRH did a

PDS report in 1980, which examined risks and hazards of dialysis; concluded standards were not needed at that time. Also sponsored Georgetown conferences in 1984-85 on device dreuse.***"

8/15/86 Memo to the Regional Administrator, Region III, HCFA, from Thomas Morford, Acting Director, Health Standards and Quality Bureau, HCFA. RE: Reuse of Hemodialyzers and Blood Lines Used for Kidney Dialysis (Robert Taylor's Memorandum dated August 5, 1986). [NOTE: **THIS MEMO CONTRADICTS PREVIOUS HCFA POLICY AGAINST FORCED REUSE OF DISPOSABLES** -- SEE THE 6/13/86 HCFA LETTER TO SEN. HEINZ ABOVE.] "The decision to reuse dialyzers and others disposables is a medical practice concern that must be made by the attending physician and the medical director of the dialysis facility. If these individuals determine that reuse is a safe practice, it is up to the patient to accept the practice or seek care from another physician or facility. BMA of Takoma Park [Washington, D.C.] has offered to assist patients in relocating to another facility if they do not want to accept the reuse policy. Therefore, we do not believe that this policy represents an inappropriate transfer burden on the patients. No adverse action against the facility should be taken because of the implementation of the reuse policy."

8/15/86 Lttr to Robt. Windom, Asst. Secretary for Health, DHHS from Sen. Heinz. RE: the NCHSR/HCTA's 8/6/86 assessment report on reuse of dialysis devices is flawed.

8/15/86 Lttr to Otis Bowen, Secretary, DHHS, from Sen. Heinz. RE: the NCHSR/HCTA'S 8/6/86 assessment report on reuse of dialysis devices is flawed -- a "grave injustice" to dialysis patients.

8/19/86 **Telecon** between J. **Michie** and John **Murphy**, M.D., Officer and Investigator, Epidemiology Investigations Service, Hospital Infections Program, CDC (Michie called). Michie read the second paragraph of the 8/11/86 memo to Dr. Roper, HCFA administrator, from Dr. Windom, Asst. Secretary for Health, concerning the NCHSR/HCTA's assessment report on dialysis device reuse. Based upon CDC's experience and his findings in dialysis clinic inspections, Dr. Murphy was asked if "patient outcomes appear to be no different in facilities that reuse dialyzers than for those facilities [that do not reuse]." Dr. Murphy did not agree with this statement. When asked whether "absence of reported increases in *** morbidity and mortality *** suggests that virtually all facilities are following adequate procedures." Dr. Murphy said this was not so.

8/21/86 Note to John Marshall, Dir., NCHSR/HCTA, from John Villforth, Dir., CDRH, FDA. RE: Preliminary summary on the 'tri-state study'. "*** [T]he anecdotal information provided in the surveys leads us to believe that problems in the area of dialysis are broad-ranging, and, in the case of reuse, appears to corroborate your own report's findings--that is, reuse done properly can be regarded as a safe procedure***."

8/22/86 Lttr to Sen. Heinz from Ron Docksai, Asst. Secretary for Legislation, DHHS, informing Sen. Heinz that the DHHS personnel who were subpoenaed for deposition "are not appearing pursuant to compulsory process***." The Docksai letter also attempted to cancel the Heinz/Windom agreement on DHHS submission of all documents on reuse to the Committee, and attempted to restrict Committee access to DHHS personnel.

8/22/86 John Marshall, Ph.D., Dir., NCHSR/HCTA, appeared at the Senate Aging Committee offices for deposition, but, on advice of PHS Chief Counsel Richard Riseberg, refused to be sworn for testimony.

8/25/86	Telecon between J. Michie and Morgan Frankel of Senate Legal Counsel. Frankel informed Michie that he had received a phone call from Richard Riseberg, PHS Chief Counsel, in which Riseberg proposed a compromise on the depositions of Erlichman and Carter. Frankel said Riseberg proposed that the deponents take an oath and tell the truth, but not be subject to prosecution for perjury. Michie and Frankel agreed that this proposition was unacceptable.
8/25/86	California Department of Health Services published a notice of proposed rule, with statement of reasons. This proposed regulation provides for informed consent for patients who reuse. The regulations require that the consent form list the advantages and disadvantages of reuse. Further, it requires that a patient will get a new dialyzer if he does not consent to reuse. The regulation is R-88-83, cited as 22 C.A.C. 75197. The statement of reasons stated: "***When a facility's policy requires a patient to either consent to 'reuse' or seek dialysis treatment elsewhere, many patients really have no choice but to consent***It it not oversimplification to state that patients may be fearful of losing the ability to be dialyzed."
8/26/86	Martin Erlichman, Health Science Analyst, NCHSR/HCTA, appeared at the Senate Aging Committee offices for deposition, but, on advice of PHS Chief Counsel Richard Riseberg, refused to be sworn for testimony.
8/26/86	Enrique Carter, M.D., Dir., OHTA, NCHSR/HCTA, appeared at the Senate Aging Committee offices for deposition, but, on advice of PHS Chief Counsel Richard Riseberg, refused to be sworn for testimony.
8/27/86	DHHS Policy Council (headed by the Under Secretary) meeting on Dialyzer Reuse. An interagency task force was established. Briefing Paper from Dr. Windom, Asst. Secretary for Health. "*** The NCHSR assessment addresses many of Senator Heinz's concerns and gives us a guide for future PHS activities.***"
8/28/86	Lttr to Richard Riseberg, PHS Chief Counsel, from Sen. Heinz, which informed Riseberg of the Senator's rulings against Riseberg's claims that the subpoenas for depositions are not valid, and that the Notary Public did not have the authority to administer an oath to the deponents.
9/3/86	James Benson, Deputy Dir., CDRH, FDA, underwent sworn deposition conducted by Senate Aging Committee staff.
9/4/86	The Interagency Task Force on Dialyzer Reuse held its first(?) meeting.
9/4/86	John Villforth, Dir., CDRH, FDA, underwent sworn deposition conducted by Senate Aging Committee staff.
9/4/86	Letter to Perry Ecksel, President, National Kidney Patients Association, from Dr. Robert Windom, Assistant Secretary for Health, DHHS, RE: Exksel's letter of 7/8/86 to DHHS Secretary Bowen. "***The findings to date indicate that when reprocessing is carried out properly, the overall risk to patients of single versus multiple use is about the same***Taken together [the PHS assessment and the FDA tri-state study] should provide an accurate picture of current clinical practices and an up-to-date scientific baseline from which the Department can decide on an appropriate course of action***With respect to informed consent and freedom of choice, I believe that such decisions fall within the realm of the physician-patient relationship.

With respect to the imposition of the GMPs, ***sections of the Federal Food, Drug, and Cosmetic Act specifically exempt from regulation 'practitioners licensed by law to prescribe or administer drugs or devices and who manufacture, prepare,***or process drugs or devices solely for use in the course of their professional practice.'***I should note that independent of the applicability of the GMPs, FDA staff collaborated with***AAMI in the development of a guideline will set forth procedures for the optimal reprocessing of dialysis equipment.***This guideline***should go a long way toward ameliorating any problems associated with the reuse of dialysis devices."

9/5/86 Lttr to Sen. Heinz from Robt. Windom, M.D., Asst. Secretary for Health, PHS. RE: creation of the Interagency Task Force on Dialyzer Reuse. "*** I expect to have a PHS implementation plan from this group no later than October 24.***" [NOTE: THIS LTTR WAS HAND-DELIVERED BY RON DOCKSAI, ASST. SEC. FOR LEGISLATION, ON 9/5/86, WHEN HE CAME TO COMMITTEE OFFICES TO MEET WITH MCCONNELL & MICHIE.]

9/8/86 Lttr to Robert Taylor, Associate Regional Administrator, Region III, HCFA, from Michael Schuster, Director of Litigation, Legal Counsel for the Elderly, American Association of Retired Persons. RE: Bio-Medical Applications of Takoma Park, ESRD Identification No.: 09-2506. This letter complains that the reuse policy of the BMA of Takoma Park, Washington, D.C. dialysis facility violates federal regulations. [NOTE: SEE THE 6/13/86 HCFA LETTER TO SEN. HEINZ ABOVE; ALSO, SEE THE 8/5/86 AND 8/15/86 HCFA MEMOS ABOVE REGARDING BMA-TAKOMA PARK.]

9/8/86 Dr. John Murphy, epidemilogist, Centers for Disease Control, underwent sworn deposition conducted by Senate Aging Committee staff.

9/10/86 Martin Ehrlichman, analyst, NCHSR/HCTA, PHS, underwent sworn deposition conducted by Senate Aging Committee staff.

9/11/86 John E. Marshall, Director, NCHSR/HCTA, PHS, underwent sworn deposition conducted by Senate Aging Committee staff.

9/12/86 Dr. Enrique Carter, Deputy Director, NCHSR/HCTA, PHS, underwent sworn deposition conducted by Senate Aging Committee staff.

9/18/86 Letter to U.S. Senator John Heinz, Chairman of the Special Committee on Aging, from Otis Bowen, Secretary, DHHS, RE: Chairman Heinz letter of 8/15/86. "***We are continuing our review of the [NCHSR] assessment on the subject of reuse and reprocessing of disposable dialysis devices***the Assistant Secretary for Health has put into place a task force to advise him on appropriate implementation actions.***The [Medicare payment for dialysis services] composite rate mirror medical practice in the dialysis community, including the reuse of dialyzers.***You can be assured that we are very mindful of our responsibility to assist in the financing of this essential medical treatment. However, we also have a responsibility to promote the most efficient program that we can, and pay for these services at a rate commensurate with the cost of furnishing them.***Therefore, we believe it would not be in the best interest of the program to withdraw the composite rate regulations at this time."

9/22/86 Letter to DHHS Secretary Otis Bowen, from Paul Feinsmith, President, National Association of Patients on Hemodialysis And Transplantation, RE: The formation of the DHHS Interagency Task Force on Dialyzer Reuse, and the refusal to allow representatives of dialysis patients to become members. "[The Chairman] Mr. Friedman stated that he believed the Public Health Service acts in the interests of beneficiaries and that the discussions the Task Force were holding were too scientific for patients to grasp. Mr. Secretary, dialysis patients must be able to understand sophisticated details of their treatment and disease because they impact so directly on the day to day life of patients."

APPENDIX II.

CORRESPONDENCE BETWEEN THE U.S. SENATE SPECIAL COMMITTEE ON AGING AND FEDERAL AGENCIES

JOHN HEINZ, PENNSYLVANIA, CHAIRMAN

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STEPHEN R. McCONNELL, STAFF DIRECTOR
DIANE LIFSEY, MINORITY STAFF DIRECTOR

United States Senate
SPECIAL COMMITTEE ON AGING
WASHINGTON, DC 20510

March 21, 1986

Honorable Otis R. Bowen, M.D.
Secretary
Department of Health and Human Services
200 Independence Avenue, S.W.
Washington, D.C. 20201

Dear Mr. Secretary:

I am writing to share with you my deep concern over the findings of the Committee's inquiry into the administration and regulation of Medicare-funded hemodialysis in the End Stage Renal Disease (ESRD) program.

My primary and most urgent concern is for the dialysis patient who may be reusing disposable dialysis devices without appropriate and necessary informed consent and without the protection of uniform federal standards.

Please find enclosed a copy of the Committee staff report which summarizes the major program deficiencies and their causes which impact directly on the health and wellbeing of dialysis patients. These alarming findings include: exposure of tens of thousands of dialysis patients to potentially dangerous and unnecessary risks in the multiple reuse of disposables; lack of informed consent and freedom of choice for patients who are requested, and in some cases coerced and forced, to reuse their disposables; and the lack of uniform and enforceable standards to ensure the safety and efficacy in reprocessing and reuse of disposable dialysis devices.

Testimony before the Committee on March 6, 1986, revealed all too clearly the severity of deficiencies in policy at the two agencies which share responsibility for the administration and regulation of the ESRD program. I was appalled to learn that both the Health Care Financing Administration and the Food and Drug Administration have yet to formulate policy regarding the reprocessing and reuse of disposable dialysis devices. Nor does there seem to be clear policy on informed consent and freedom of choice for dialysis patients.

The gravity of this situation may require your personal attention. As a beginning, I would urge you to seriously consider imposing as quickly as possible the FDA's Good Manufacturing Practices (GMPs) requirements on those dialysis clinics that reprocess and reuse disposable dialysis devices. The latest version (copy enclosed) of the FDA Reuse Committee's "Working Paper: Policy Considerations For The Reprocessing Of

Devices" states that "all reprocessors should be required to comply with [GMP] regulations (21 CFR 820) to assure that the reprocessed device continues to be safe and effective for its intended use." The paper also discusses the very clear language in the regulation pertaining to a "reprocessor's responsibility:

> "Federal regulation 21 CFR 820.3(k) defines a manufacturer as "any person, including any repacker and/or relabeler, who manufactures, fabricates, assembles or processes a finished device" (emphasis added). Accordingly, the Reuse Committee believes that any person who reprocesses a medical device, should be considered a manufacturer."

It is my hope that the Department will do everything possible to provide the necessary safeguards for the 78,000 dialysis patients who rely upon the ESRD program for their very survival. Please let me know if the Committee and its staff can in any way be of service to you in this endeavor.

Sincerely,

JOHN HEINZ
Chairman

Enclosures

JH:jfm

P.S. Dr Bowen; every informed medical expert I've talked to agrees that re-use 20, 30 and more times is truly dangerous and hazardous, as is the amount of formaldehyde and its rinsing as part of any processing for re-use. I counsel an immediate interim standard to eliminate the worst problems while more comprehensive GMP regs. are developed. J.

THE SECRETARY OF HEALTH AND HUMAN SERVICES
WASHINGTON, D.C. 20201

APR 29 1986

The Honorable John Heinz
Chairman
Special Committee on Aging
United States Senate
Washington, D.C. 20510

Dear Mr. Chairman:

This responds to your letter expressing your concerns over the reuse and reprocessing of disposable dialysis devices in the End Stage Renal Disease (ESRD) program.

I agree with you that we need to do all that is possible to protect the health and rights of ESRD patients. Dr. John Marshall's testimony at your March 6 hearing reemphasized the strong commitment the Department has maintained for the welfare of ESRD patients in implementing and improving this program since its inception in 1972.

Dialyzer reuse is a recognized medical practice which has a history of safety dating back to 1967. Despite a sharp rise in the practice of reuse during the 1980's, morbidity and mortality statistics have remained unchanged. In addition, a 1986 study reveals that morbidity and mortality statistics are the same for reuse patients and non-reuse patients. In our view there is no convincing evidence to indicate any health hazard associated with reuse if the dialyzer is reprocessed properly. In fact, reprocessing prevents certain hazards associated with new filters that occur with some patients. The few reports of adverse reactions involving hemodialysis patients have been attributed to improper procedures which resulted, for example, in inadequate sterilization. With the development of revised standards for the reuse of hemodialyzer products by the National Kidney Foundation and the new Association for the Advancement of Medical Instrumentation guidelines for the proper reprocessing, resterilization and reuse of dialyzers, we believe that adequate safeguards will exist to assist those who practice reuse. These guidelines, which delineate safe procedures ranging from disinfection to patient monitoring to environmental concerns, should assure the safety of both patients and staff.

Since 1979, the Department has undertaken several studies on the safety of dialyzer reuse including work by the National Institutes of Health, the Food and Drug Administration, and other components. These studies have indicated that patients treated with reused devices are at no greater risk if the devices are adequately reprocessed.In addition to these extensive efforts, to assure further that all existing scientific information is thoroughly considered, the Acting Assistant Secretary for Health has directed the National Center for Health Services Research (NCHSR) to complete another formal assessment with respect to safety, efficacy and cost-effectiveness of dialyzer reuse. This effort was announced in the April 10, 1986 Federal Register (copy enclosed). NCHSR has invited public comment on the issues and the submission of medical and scientific data. In addition, NCHSR staff will be meeting with medical associations to hear their views. Should this study reveal the need for any action by either the Public Health Service or the HCFA, the Department will act promptly.

You requested that I consider imposing Good Manufacturing Practice regulations on physician directed dialysis clinics that reprocess and reuse disposable dialysis devices. Our legal counsel reminds us that the Federal Food, Drug, and Cosmetic Act, sections 510 (g)(2), 519 (b)(1) and 704 (a)(2), specifically exempts from device regulation "practitioners licensed by law to prescribe or administer drugs or devices and who manufacture, prepare, propogate, compound or process drugs or devices solely for use in the course of their professional practice." As you can see, the statutory language raises potential legal issues. Should the NCHSR study reveal a need for further regulatory action, we will examine all options.

I appreciate receiving your views on this important public health matter. Please be assured that the Department will continue its commitment to the health and safety of ESRD patients and to the continued improvement of this program according to our legal mandate and the latest scientific and medical knowledge.

Sincerely,

Otis R. Bowen, M.D.
Secretary

Enclosure

Assessment of Medical Technology; Reuse of Hemodialysis Devices Labeled For "Single Use Only"

The Public Health Service (PHS) through the Office of Health Technology Assessment (OHTA), within the National Center for Health Services Research and Health Care Technology Assessment (NCHSR&HCTA) announces that it is performing an assessment on what is known of the risks and/or benefits associated with the use of reprocessed hemodialyzers, blood lines, transducer filters and dialyzer caps which are labeled by manufacturers for "single use only," and are reused in the treatment of patients undergoing chronic maintainance hemodialysis for end-stage renal disease.

Specifically, the assessment of the risks and/or benefits associated with reprocessing and reuse seeks to determine the following: (1) Is it safe and efficacious to reuse these devices under existing clinical and reprocessing practices?; (2) When reused under existing clinical and reprocessing practices, is there potential for dialysis patients to suffer infections or other short and/or long term adverse effects, associated with formaldehyde or other chemicals used in the reprocessing of dialysis devices; (3) What is the extent of reuse of dialysis devices, including the dialyzer, blood lines, transducer filter and dialyzer caps?; (4) What guidelines and/or recommendations, if any, exist for the reprocessing and reuse of "single use only" dialyzers, blood lines, transducer filters and dialyzer caps?; (5) To what extent are such guidelines followed and/or defined as accepted medical practice?; (6) Are there any ethical considerations associated with the reprocessing and reuse of these devices?; (7) How does the cost of single use of each of these devices compare with the cost of reprocessing each of these devices?

PHS assessments consist of a synthesis of information obtained from the medical literature, appropriate organizations in the private sector as well as from PHS agencies, and others in the Federal Government. This assessment intends to incorporate the most current information concerning the safety and clinical effectiveness of the practices of reprocessing and reusing the subject dialysis devices. Any existing medical or industry guidelines regarding these practices will also be addressed. Any person or group wishing to provide OHTA with information relevant to this assessment should do so in writing no later than 60 days from the date of publication of this notice.

The information being sought concerns past, current, and planned research related to the practices of reprocessing and reuse of the dialysis devices listed above. A well-designed clinical studies, and information related to the clinical acceptability and effectiveness of these practices is also sought, along with recommendations on how to ensure safety and efficacy of these practices and to meet the needs of the dialysis patient, physician and clinic.

Written materials should be submitted to: Harry Handelsman, D.O., or Mr. Martin Erlichman, Office of Health Technology Assessment, Park Building, Room 3/10, 5600 Fishers Lane, Rockville, MD 20857 (301) 443–4990.

Dated: April 3, 1986.

Enrique D. Carter,

Director, Office of Health Technology Assessment, National Center for Health Services Research and Health Care Technology Assessment.

[FR Doc. 86–8043 Filed 4–9–86; 8:45 am]

BILLING CODE 4160–17–M

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United States Senate
SPECIAL COMMITTEE ON AGING
WASHINGTON, DC 20510

May 12, 1986

Honorable Frank E. Young, M.D., Ph.D.
Commissioner
Food and Drug Administration
Department of Health and Human Services
5600 Fishers Lane
Rockville, Md. 20857

Dear Dr. Young:

I am writing to request that the Food and Drug Administration (FDA) act expeditiously on the enclosed petition in the interest of the safety and health of Medicare's 78,000 dialysis patients.

The alarming testimony and evidence revealed at the Aging Committee's hearing on March 6, 1986, made it all too clear that we have no studies, no standards, and thus no surety that reprocessing of dialysis devices can and will be done properly. Yet more than 60 percent of dialysis clinics nationally reprocess and reuse these devices as many as 20 and 30 times, needlessly exposing patients to potentially life-threatening risks and even death due to lack of quality control.

These disturbing findings, coupled with the FDA's continuing inaction, compells my colleagues and me to petition under provisions of the Administrative Procedure Act. On behalf of all dialysis patients, we seek to have the FDA impose its regulation requiring good manufacturing practices (GMP's) on dialysis facilities that reprocess and reuse filters, bloodlines and other devices.

Mr. Commissioner, the GMP's were promulgated by your agency in 1978 to ensure quality control in the manufacture, processing and reprocessing of medical devices. FDA's own "reuse committee" produced a working paper in February of this year recommending that the GMP's be applied to the more than 600 dialysis clinics involved in reprocessing and reuse of dialysis devices. Please find attached a copy of that working paper.

Therefore, my colleagues and I strongly urge that you expedite the FDA's action in responding to our petition so that

Honorable Frank E. Young, M.D., Ph.D.
May 12, 1986
Page 2

dialysis patients may be afforded some protection in the requirement for quality control under the standards of the GMP's.

Thank you for your cooperation and assistance in this important matter.

Sincerely,

John Heinz

JOHN HEINZ
Chairman

JH:jfm

JOHN HEINZ, PENNSYLVANIA, CHAIRMAN

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United States Senate
SPECIAL COMMITTEE ON AGING
WASHINGTON, DC 20510

BEFORE THE FOOD AND DRUG ADMINISTRATION, DEPARTMENT OF
HEALTH AND HUMAN SERVICES
WASHINGTON, D.C.

May 12, 1986

Dockets Management Branch
Food and Drug Administration
Dept. of Health and Human Services
Room 4-62
5600 Fishers Lane
Rockville, Md. 20857

This is a petition for amendment of a rule, and other administrative action pursuant to the Administrative Procedure Act, 5 U.S.C. 551 et. seq., and Title 21 C.F.R. 10.1 et. seq. (1985). The undersigned submit this petition under section 553(e) of the Administrative Procedure Act, and the Food, Drug, and Cosmetic Act, 21 U.S.C. 201 et. seq. (the Act). Petitioners argue that the growing practice of reusing and reprocessing dialysis devices is exposing dialysis patients to serious health risks. Further, the facilities practicing reuse are "adulterating" the devices in violation of the Act, 21 U.S.C. 351 (1982). The undersigned believe that application of the Good Manufacturing Practices (GMPs) to the reprocessing of dialysis devices would alleviate this risk, and bring the practice into conformity with the Act.

Petitioners submit that current regulations already apply to dialysis facilities. The language of the Good Manufacturing Practices, 21 C.F.R. 820 et. seq., should be given its plain meaning, thereby requiring reprocessors of dialysis devices to conform to the regulations. This interpretation was recently affirmed by an FDA internal task force report that adopted this position. Petitioners therefore request that the Commissioner of Food and Drugs exercise his statutory investigative and enforcement powers with regard to hemodialysis facilities and clinics which reuse dialysis equipment and accessories.

In the alternative, petitioners claim that the regulations should be amended to make clear that dialysis facilities are covered by the regulations. Petitioners, therefore, request the Commisioner of Food and Drugs to modify and amend the existing regulations and thereby change the agency's interpretation of the GMPs and apply them to the reuse and reprocessing of dialysis devices.

A. Action requested

1. Petitioners request that the FDA read the regulations according to their plain meaning, and thereby interpret the regulations codified at 21 C.F.R. 820 et. seq. (the Good Manufacturing Practices) to apply to the reuse and reprocessing of dialysis devices by dialysis facilities.

2. In the alternative, petitioners request that the regulations be modified and amended.

At present, there is no definition of "reprocessor" in the regulations. The regulations, however, define a "manufacturer" in the following manner:

> "'Manufacturer' means any person, including any repacker and/or relabeler, who manufactures, fabricates, assembles, or processes a finished device. The term does not include any person who only distributes a finished device." 21 C.F.R. 820.3(k)(1985).

Petitioners request the regulations be modified and amended as follows:

> (A) The definition of "manufacturer" found in 21 C.F.R. 820.3(k)(1985) should be amended to say: "'Manufacturer' means any person, including any repacker, relabeler and/or reprocessor, who manufactures, fabricates, assembles, processes, or reprocesses a finished device. The term does not include any person who only distributes a finished device."

(B) Add new subsection "(o)" to section 820. This new subsection would define "reprocessor" as follows:

> "A facility or clinic that practices hemodialysis and flushes the equipment with formaldehyde or other such manufacturing material so the device can be used more than one time."

B. Statement of Grounds

Petitioners are United States Senators and members of the U.S. Senate Special Committee on Aging (the Committee). The Committee conducted an in-depth four month investigation of hemodialysis practices and procedures. The results of this investigation were disclosed at a hearing held on March 6, 1986. A copy of the Committee report that coincided with the hearing has been attached, as well as the prepared statements of witnesses, and the transcript of the proceedings (hereinafter referred to as the transcript) that contains the opinions and views of interested persons. These will become part of the record of this petition pursuant to 21 C.F.R.

10.30(g)(1985). According to the investigative study performed by Committee staff, reuse of dialysis devices is a growing practice in many dialysis clinics. Although the devices used in the dialysis process are labeled "single use only" by the manufacturers, more than 60% of the dialysis clinics are reprocessing and reusing these devices as many as 20 or 30 times by flushing out and "disinfecting" them with a solution made from water and formaldehyde or some other disinfectant chemical.

Because of the clinical practice of reuse and reprocessing, tens of thousands of dialysis patients may be exposed to dangerous and unnecessary risks. These risks include:

1. Exposure to formaldehyde, a known carcinogen that is used in most clinics to "disinfect" the dialysis devices.

2. Formaldehyde residue is trapped in the devices after reprocessing, and leaches out into the blood of dialysis patients.

3. Hemolysis, the destruction of red blood cells.

4. Formation of antibodies in the patient's blood which may interfere with kidney transplantation.

5. Severe allergic reaction which may result in the patient's death.

6. The threat of infection from deadly bacteria that may contaminate water supplies used in the reprocessing process regardless of what disinfectant chemical may be used.

7. The potential danger from air getting into the patient's bloodstream because the reused blood lines become cracked and loosely connected.

8. Other side effects from reuse including: fainting, dizziness, severe headaches, and fatigue.

The hazards associated with reuse were illustrated by the dialysis patients who testified at the hearing. For example, Ms. Melinda McFadden, a dialysis patient for eight years, testified that since her clinic began reusing her dialysis equipment, she has suffered from severe headaches, fainting, nausea, itching and fatigue. (See p. 5 of transcript). Mr. Vagn Vogter explained other problems that accompany reuse. He said that after repeated reuse, the lines going from the patient's arm into the dialysis machine become brittle and the connection becomes loose. In addition, Mr. Vogter stated that because of reuse, the blood lines develop air holes, and air can become infused into the patient's bloodstream. (See p. 16 of transcript). Finally, Mr. Robert Rosen testified that when he complained to the FDA about the problems with reuse, and that patients were becoming ill, the FDA's response was that this was not a matter within their concern. "The FDA ...informed me that I, as a dialysis patient, [o]n the issue of reuse am out of their jurisdiction." (See p. 14 of transcript). For a more detailed discussion about the dangers of formaldehyde as a disinfectant, see pp. 18-53 of the hearing transcript containing the testimony of physicians and scientists.

A major cause of the danger from reuse is the lack of uniform and enforceable standards to ensure safety and efficacy in the reprocessing and reuse of the dialysis devices. This has resulted in substantial variance in reprocessing techniques and procedures.

The FDA has been charged with maintaining the safety and efficacy of medical devices under the Federal Food, Drug, and Cosmetic Act. In 1978, pursuant to the Act, the FDA promulgated the Good Manufacturing Practices (GMPs). (See 21 U.S.C. 360j(f)(1982) which authorizes the Secretary to prescribe regulations governing devices). The GMPs were enacted to ensure that the methods used in, and the facilities and controls used for, the manufacture, packing, storage, and installation of medical devices conform to regulatory requirements, thereby assuring that devices are safe, effective and otherwise in compliance with the Act. 43 Fed. Reg. 31508 (July 21, 1978). The regulations have been codified at 21 C.F.R. 820 et. seq. (1985).

According to these regulations, special requirements are imposed upon those that reprocess medical devices. These requirements include:

> 1. Written manufacturing specifications and processing procedures shall be established, implemented, and controlled to assure that the device conforms to its original design. 21 C.F.R. 820.100 (1985).
>
> 2. Reprocessing procedures shall be established, implemented and controlled to assure that the reprocessed device meets original specifications. 21 C.F.R. 820.115 (1985).

There are additional requirements upon "critical devices". As defined in 21 C.F.R. 820.3(f)(1985), critical devices includes dialysis systems and accessories. (See also 43 Fed. Reg. 31512 (July 21, 1978) which specifies that hemodialysis systems and accessories are classified by the FDA as critical devices.) When there is constant reprocessing of a device, the regulations require that a determination of the effect of reprocessing upon the device must be made and documented. 21 C.F.R. 820.116(a)(1985). Further, "manufacturing material" (defined in 21 C.F.R. 820.3(1) as "any material such as a cleaning agent,...or other substance used to facilitate a manufacturing process") that is used on or in the manufacturing equipment or the device must be subsequently removed from the device or limited to a specified amount that does not adversely affect the device's fitness for use. 21 C.F.R. 820.60(d)(1985). According to the GMPs, the failure to comply with these regulations renders a device "adulterated", in violation of the Act. 21 C.F.R. 820.1(a)(1985).

Petitioners argue that the language of the GMPs is already applicable to the reuse and reprocessing of dialysis devices. Giving the words their ordinary meaning in common usage, the definition of "manufacturer" governs the operations of dialysis facilities that reuse dialysis equipment. In addition, these facilities are subject to additional requirements because they reprocess critical devices. Further, since residue from formaldehyde (used as a cleaning agent in most clinics) remains in the device after reuse, reprocessing facilities are not complying with GMP requirements, and are therefore violating the Act.

Moreover, an internal task force within the FDA has adopted this interpretation of the regulations. In its report of Feb. 24, 1986 entitled "Working Paper: Policy Considerations for the Reprocessing of Devices" (attached), the Reuse Committee said that

> "[A]ll reprocessors should be required to comply with Good Manufacturing Practice (GMP) regulations to assure that the reprocessed device continues to be safe and effective for its intended use." (See p. 15).

The report concludes that any person who reprocesses a medical device be considered a manufacturer.

> "Facilities which process medical devices for reuse***are considered manufacturers if they perform large scale, routine reprocessing of devices. In particular, routine reprocessing of hemodialyzers should be construed within the activity performed by a manufacturer." (See p. 19).

Along with the plain language of the regulations, the regulatory history of the GMPs supports applying them to reprocessors and reusers of dialysis equipment. It shows that the FDA intended to regulate the manufacture of specific devices. 43 Fed. Reg. 31508 (July 21, 1978). In addition, the purpose of the GMPs was to maximize the probability that only safe and effective devices reach the marketplace. 43 Fed. Reg. 31508, 31509 (July 21, 1978). Further, the history illustrates it was intended that manufacturers would be subject to the regulations. The notice printed in the Federal Register specifically expressed "The industry should understand***that this regulation has the force of law, and that violation of its provisions are a basis for seizure, injunction, and for prosecution." 43 Fed. Reg. 31526 (July 21, 1978). Moreover, the regulations provide an exemption for manufacturers who believe they should not be subject to its provisions. Since manufacturers must take the affirmative step of petitioning for an exemption, it is clear that the GMPs are presumed to apply to all manufacturers. 43 Fed. Reg. 31526 (July 21, 1978).

Despite the apparent applicability of the regulations, the FDA has never subjected reprocessors of dialysis devices to these requirements. Instead, the FDA's position has been that reprocessing and reuse of dialysis devices is a matter of "medical practice" and not to be interfered with.

Specifically, the FDA position is that the GMPs are procedures designed for manufacturers of medical devices to produce quality products (See p. 71 of transcript). According to Dr. John C. Villforth, Director for the Center for Devices and Radiological Health of the Food and Drug Administration:

> "[The FDA] has not, in the past, considered [reprocessing and reuse of dialysis devices] to be manufacturing or remanufacturing under the intent of the [regulations]***Washing devices does not have anything to do with the manufacturing of devices". (See pp. 70-72 of transcript).

The result of FDA's policy is that thousands of dialysis patients are being treated with reused and reprocessed devices, posing a substantial and unnecessary health risk, and that there are no uniform standards to ensure safety and efficacy in the reprocessing and reuse of these devices. Consequently, there is wide variance in reprocessing techniques and procedures.

As discovered by the Aging Committee's investigation, and exemplified by the witnesses at the hearing, there are significant health risks that accompany the reuse and reprocessing of dialysis devices. Tens of thousands of dialysis patients are being exposed to risk of sickness, injury, and death. According to the study group within the FDA, as well as the plain meaning of the GMPs, dialysis facilities already fall under the regulations. In the alternative, amending the GMPs in the manner requested would also help to alleviate this risk. By enforcing the GMP regulations against dialysis facilities, the

FDA would be complying with the original intent of the Act and the regulations to ensure that safe and effective medical devices are used. Most importantly, the FDA would be protecting innocent patients whose lives are dependent on the safe use of these devices.

C. Certification

The undersigned certify, that, to the best knowledge and belief of the undersigned, this petition includes all information and views on which the petition relies, and that it includes representative data and information known to the petitioners which are unfavorable to the petition.

Respectfully submitted,

John Heinz
JOHN HEINZ
Chairman

John Glenn
JOHN GLENN
Ranking Minority
Member

Larry Pressler
LARRY PRESSLER
U.S. Senator

Lawton Chiles
LAWTON CHILES
U.S. Senator

Chuck Grassley
CHARLES GRASSLEY
U.S. Senator

J Bennett Johnston
BENNETT JOHNSTON
U.S. Senator

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STEPHEN R. McCONNELL, STAFF DIRECTOR
DIANE LIFSEY, MINORITY STAFF DIRECTOR

United States Senate
SPECIAL COMMITTEE ON AGING
WASHINGTON, DC 20510

June 19, 1986

Honorable Frank E. Young, M.D., Ph.D.
Commissioner
Food and Drug Administration
Department of Health and Human Services
5600 Fishers Lane
Rockville, Md. 20857

Dear Dr. Young:

As Chairman of the Special Committee on Aging, I am writing to request your further assistance in the Committee's continuing investigation into the Food and Drug Administration's (FDA) regulation of dialysis devices.

Specifically, I am requesting that you provide Committee staff with any and all correspondence, memoranda, reports, Establishment Inspection Reports (EIR's) and another records and documentation generated and received by the Food and Drug Administration and pertaining to bacterial infections and any other adverse experiences associated with the reprocessing and reuse of dialysis devices during the past year.

I would very much appreciate your providing these materials to Committee staff on an incremental basis as they become available. Should you or your staff have any questions regarding this request, please have your staff contact Jim Michie or David Cunningham at 224-5364.

Thank you for your assistance and cooperation in this matter.

Sincerely,

John Heinz

John Heinz,
Chairman

JH/jfm

JOHN HEINZ, PENNSYLVANIA, CHAIRMAN
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United States Senate
SPECIAL COMMITTEE ON AGING
WASHINGTON, DC 20510

July 14, 1986

Honorable Otis R. Bowen, M.D.
Secretary,
Department of Health and Human Services
200 Independence Avenue, S.W.
Washington, D.C. 20201

Dear Mr. Secretary:

This is to request your assistance in obtaining documents that are pertinent to this Committee's oversight of the Medicare End Stage Renal Disease Program.

In light of the Committee's interest in the Department's considerations and actions for protecting the health and safety of dialysis patients, I am requesting that your office provide any and all documents pertaining to the reprocessing and reuse of dialysis devices that were generated and or received during the period of April 10, 1986 to the present by personnel of the NCHSR, FDA, CDC, the Office of the Secretary of the Department of Health and Human Services, Office of the Assistant Secretary for Health, Office of the Secretariat, Offices of the National Institute of Health and the Office of Assistant Secretary for Legislation. Please forward this material to me by July 21, 1986.

I am informed that a meeting of approximately one dozen Department of Health and Human Services personnel and officials was conducted on July 8, 1986 to discuss the findings of the NCHSR "Assessment of Medical Technology; Reuse of Hemodialysis Devices Labeled For Single Use Only." Attendance at the meeting included: Robert Windom, Assistant Secretary for Health; Steve Grossman, Deputy Assistant Secretary for Health (Planning and Evaluation); Robert Eccleston, Assistant Director for Intergovernmental Liaison; Hanns Kuttner, Special Assistant, Office of the Assistant Secretary for Legislation; Valery Setlow, Policy Analysis, Office of Health Planning and Evaluation; James Benson, Deputy Director, Center for Devices and Radiological Health, Food and Drug Administration (FDA); Lawrence Kobren, Center for Devices and Radiological Health, FDA; John Marshall, Ph.D., Director, National Center for Health Science Research (NCHSR); Dr. Enrique Carter, Director, Office of Health Technology Assessment (OHTA), NCHSR; Martin Erlichman, OHTA, NCHSR and Martin Favero, Ph.D, Chief, Nosocomial Infections Laboratory Branch, Hospital Infections Program, Center for Infectious Diseases, Center for Disease Control.

Further, it is my understanding that there was discussion at the July 8, 1986 meeting of a specific memorandum dated July 8, 1986, which was generated by the Director of NCHSR for the Assistant Secretary for Health. I am requesting that a copy of this memorandum, along with whatever records (written or electronic) were generated to memorialize the discussions of the meeting, be forwarded to me by close of business July 16, 1986.

Should you or your staff have any questions regarding this request, please have your staff contact David Cunningham or David Schulke at 224-5364.

Thank you for your cooperation and assistance in this matter.

Sincerely,

John Heinz

John Heinz,
Chairman

JH/dc

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STEPHEN R. McCONNELL, STAFF DIRECTOR
DIANE LIFSEY, MINORITY STAFF DIRECTOR

United States Senate
SPECIAL COMMITTEE ON AGING
WASHINGTON, DC 20510

July 18, 1986

Honorable Otis R. Bowen, M.D.
Secretary
Department of Health and Human Services
200 Independence Avenue, S.W.
Washington, D.C. 20201

Dear Mr. Secretary:

I am writing to share with you my continuing concern over the administration and regulation of the Medicare-funded End Stage Renal Disease program (Hemodialysis) and the issue of reuse of disposable dialysis devices.

On March 21, 1986, I wrote to you concerning the Committee's findings from the hearing held on March 6, 1986, regarding the reprocessing and reuse of dialysis devices. The testimony and evidence presented at the hearing revealed that there are no studies, no standards, no monitoring and thus no assurance that reuse can and will be done properly.

My primary concern for writing you then and now is for the dialysis patient who may be reusing reprocessed dialysis devices and who may not be provided the necessary and appropriate informed consent and freedom of choice to reuse or not to reuse their dialysis devices. Since I last wrote you on this matter, I and other members of the Aging Committee have taken specific action to address the problems revealed at the Committee's March 6, 1986, hearing. These include: (1) filing a petition on May 12, 1986 with FDA Commissioner, Frank Young, M.D., which seeks to have the FDA impose the Good Manufacturing Practices (GMP's) regulations on reprocessors of dialysis devices; (2) submitting a response on June 9, 1986, to the National Center for Health Science Research (NCHSR) Federal Register Notice concerning an "Assessment of Medical Technology: Reuse of Hemodialysis Devices labeled for Single Use Only,"; and (3) introduction on June 12, 1986, of the 1986 ESRD Patient Rights Act, S. 2547, requiring that dialysis patients be provided informed consent and freedom of choice to decide whether or not to reuse.

In my previous correspondence, I urged you to consider imposing FDA's Good Manufacturing Practices (GMP's) on those dialysis clinics that reprocess and reuse dialysis devices. The need for the application of the GMP's to dialysis clinics practicing reuse has been underscored by the recent bacteremia outbreaks at six dialysis clinics nationwide. Four of the outbreaks involve the chemical disinfectant "RenNew D", manufactured by Alcide corporation. The outbreaks occurred in California, Texas and Florida and resulted in 21 cases of infection, and possibly two deaths. The outbreak is under investigation by both the CDC and FDA. Alcide corporation has initiated a nationwide recall on "RenNew D." Enclosed for your information is a copy of the CDC's "Morbidity and Mortality Weekly Report" article on the incidents at Inglewood, California and Dallas, Texas. Also, I have included copies of the Medical Device Reports (MDR's) filed by the manufacturer with the FDA.

In addition to the bacteremia outbreaks noted above, I am aware that the FDA and CDC have under investigation another episode of infections. This incident involves the reuse disinfectant "Renalin", manufactured by Renal Systems Inc. These outbreaks were located at two dialysis clinics in Georgia, and may have resulted in four patients receiving bacteremia infections. The CDC is currently preparing a report on their investigation.

The outbreaks of infection described above are not unlike those which occurred in Baton Rouge, Louisiana, in 1982, in which 140 patients were infected and 14 dialysis patients died. The patient deaths were linked to faulty reprocessing. Incidents of this kind could be avoided if dialysis reprocessors were required to meet the GMP's, as is required by the Food, Drug and Cosmetic Act. This position is supported in the FDA Reuse Committee's "Working Paper: Policy Considerations For The Reprocessing Of Devices," which states that "all reprocessors should be required to comply with [GMP's] regulations (21 CFR 820) to assure that the reprocessed device continues to be safe and effective for it's intended use."

In light of these recent incidents, I again urge you to immediately impose the GMP's on reprocessors of dialysis devices in the interest of protecting the health and safety of dialysis patients.

Sincerely,

John Heinz

John Heinz,
Chairman

Attachments

JH/dc

JOHN HEINZ, PENNSYLVANIA, CHAIRMAN

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United States Senate
SPECIAL COMMITTEE ON AGING
WASHINGTON, DC 20510

July 23, 1986

Honorable Otis R. Bowen, M.D.
Secretary,
Department of Health and Human Services
200 Independence Avenue, S.W.
Washington, D.C. 20201

Dear Mr. Secretary:

As Chairman of the Special Committee on Aging, I am writing to share with you my deep concern and dismay over learning that department officials presented inaccurate and misleading testimony before the Committee at the March 6, 1986 hearing on the reuse of dialysis devices.

I recently learned of a memorandum prepared by John Marshall, Ph.D., Director, National Center for Health Services Research and Health Care Technology Assessment (NCHSR/HCTA), for Robert E. Windom, M.D., Assistant Secretary for Health. The memorandum, a copy of which I have enclosed, is based upon the NCHSR/HCTA's "Assessment of Medical Technology: Reuse of Hemodialysis Devices Labeled for Single Use Only" initiated in April 1986, following the Committee's March 6 hearing.

This alarming and shocking memorandum reveals all too clearly a severe breakdown in communications and coordination among the agencies responsible for the safety and well-being of dialysis patients: the National Institutes of Health (NIH); the Food and Drug Administration (FDA); the Health Care Financing Administration (HCFA); and the Centers for Disease Control (CDC). Indeed, as Dr. Marshall observed in his memorandum, these agencies "have had a long but non-productive involvement with [reuse] issues." Moreover, it confirms many of the serious concerns regarding the safety of reuse that were raised in the Committee's staff report as well as in testimony, but denied or dismissed by witnesses representing the Department of Health and Human Services (DHHS). The Marshall memorandum states, however, that the NCHSR/HCTA assessment "uncovered serious omissions and inaccuracies in the testimony."

The memorandum indicates that Dr. Marshall, the Department's principal witness at the March 6 hearing, was himself the victim of misinformation and lack of information regarding the safety and efficacy of dialysis device reprocessing and reuse. Further, the findings of the NCHSR/HCTA assessment serve as a strong indictment of failure on the part of those who were responsible for providing Dr. Marshall with accurate and complete information in preparation for his testimony.

The Marshall memorandum establishes that much of the information and data previously used to support the "safety" of reuse, such as the NIH report "Multiple Use of Hemodialyzers" (e.g., the Dean report), is unreliable.

I trust now that you can understand and appreciate why I continue to be deeply concerned for the health and safety of this nation's 80,000 dialysis patients, many of whom have falsely and wrongly been misled into believing that there are no risks associated with the reuse of their dialysis devices.

In light of the NCHSR/HCTA assessment findings and the most recent outbreaks of life-threatening bacterial infections in dialysis patients subjected to reuse, I strongly urge you to take immediate action on Dr. Marshall's recommendation:

> "The Public Health Service needs to take a clinically and scientifically based stand with respect to this issue. We need to communicate that directly and emphatically to the Health Care Financing Administration, even if that means recognizing that our earlier testimony was flawed."

In addition, and in the interest of adequately protecting dialysis patients from any further threat of harm and injury, I am requesting that you take immediate action on my earlier recommendations: (1) require dialysis clinics to adequately inform their patients of the risks of reuse and prohibit the clinics from coercing and forcing patients to reuse their dialysis devices; (2) withdraw HCFA's proposed regulations that would lower the dialysis reimbursement rate and, consequently, force still more clinics to reprocess and reuse dialysis devices; (3) conduct appropriate and controlled preclinical and clinical testing to determine the safety and efficacy of the reprocessing and reuse of dialysis devices; and (4) direct the FDA to impose its good manufacturing practice regulations on reprocessors of dialysis devices, and to develop uniform safety standards for the reprocessing and reuse of dialysis devices and supplies.

Should you or your staff have any questions regarding this request, please have your staff contact Jim Michie or David Schulke at 224-5364.

Thank you for your cooperation and assistance in this important matter.

Sincerely,

John Heinz,
Chairman

Enclosure

JH:jfm

DEPARTMENT OF HEALTH & HUMAN SERVICES Public Health Service

Memorandum

Date JUL 8 1986

From Director, National Center for Health Services Research and Health Care Technology Assessment

Subject Hemodialyzer Reuse

To Assistant Secretary for Health

ISSUE

As HCFA continues to ratchet down the reimbursement rate for hemodialysis, concern has grown on the part of hemodialysis patients and the Congress, with respect to the safety and efficacy of the reuse of dialysis equipment, including bloodlines, tubing, transducer caps, and filters. Senator Heinz was sharply critical of the Public Health Service's role in this process during hearings which he conducted on March 6 of this year. The involvement of NCHSR is only recent, but NIH, FDA and CDC have had a long but non-productive involvement with these issues. During the March 6 hearing, at which I was the witness for the PHS, accompanied by John Villforth of FDA, we agreed to do an assessment of the state-of-the-art. As events have unfolded, it is clear that the March 6 testimony was not based on all of the germane facts and that we may need to take a position counter to that which we argued on March 6. We need to ascertain a PHS position and inform HCFA of that position so as to minimize embarrassment for the Department.

BACKGROUND

The March 6 hearing focused on the following issues:

1. Does adequate information exist to determine what standards are necessary for adequate disinfection of dialysis equipment?

2. How many uses of a given unit should be permitted before its integrity is compromised?

3. What is the Department doing to monitor adverse effects?

4. Are patients being fully informed of the risks attendant to dialyzer reuse and is their freedom of choice being compromised?

In 1978, the Congress directed NIH to carry out a study of hemodialysis. A contract was let which led to release of the Dean Report in 1981. The Dean Report was subsequently revised in 1982. The essential conclusion of the Dean Report was that processing, when properly effected, could yield a hollow tube filter equivalent to a new filter. Arthur D. Little, Inc. was a subcontractor to this effort and it released a criticism of the Dean report arguing that its efforts had been improperly represented and that the report was limited to an in vitro assessment which ignored clinical data.

In 1982, a departmental Interagency Task Force recommended clinical trials to address the questions identified above. That report was not sent forward from the Public Health Service to the Secretary's office. Instead, in 1983 an ESRD Coordinating Committee was established. The ESRD Coordinating Committee recommended against clinical trials on the grounds that they were not necessary and would be too expensive. They did recommend that FDA establish a registry to track events.

One of the major pursuits of Senator Heinz at the hearing was a demand that the Department undertake rigorous clinical trials. As the witness, I argued that even though there had been an increase from 15 to 65 percent of the Centers which were reusing the dialysis equipment, it was found that there had been no increase in reports of mortality or morbidity. In fact, some literature suggests that there are more untoward events with first use filters than with subsequent use filters. The apparent increase in reuse was probably stimulated by the reimbursement caps effected by HCFA. Interestingly, the price of a dialyzer unit has dropped from the $28 to $30 range to a $10 to $12 range. Reprocessing costs between $7 and $9, so at the present, the cost differential is not great.

FDA labels these devices for single use. But, it has approved reprocessing equipment. There are, however, no guidelines for the use of approved reprocessing equipment. Voluntary standards have been under development by the Association for the Advancement of Medical Instrumentation for several years, but their release continues to be delayed. In any case, they do not address the question of reuse for bloodlines, tubing, the transducer caps, or the transducer filters. Senator Heinz has argued that there should be rigorous standards which are enforced by HCFA. He faults the Public Health Service for not developing such standards. He is well aware that the buck passes from one agency to another with no one accepting responsibility for action. In part, that reflects HCFA's lack of interest in standards because it doesn't have resources for compliance monitoring and enforcement.

Senator Heinz also argues that the reprocessing of filters should be subject to the Good Manufacturing Practices Act. FDA has maintained that the reuse of the filter is a clinical matter and FDA does not regulate or monitor the practice of medicine.

FDA has approved the marketing of two disinfectants which are advertised as being less toxic than formaldehyde. One of these ReNew-D has been implicated in recent outbreaks of bacteremia in which at least one person has died. Two of these outbreaks have been in Florida. One each have occurred in Texas and California. The distributer of ReNew-D, Alcide has withdrawn it from the market.

CDC has investigated a 1983 outbreak in Louisiana in which 27 individuals were affected, 14 of whom died. CDC is investigating the current outbreaks. The question remains unanswered whether this was because of a failure of the disinfectant, or whether it was a matter of improper processing. Although I testified, based on information received from CDC, that they have a standard expressing the adequacy of the use of 4% formaldehyde solution, this is apparently not a formal standard and indeed there are no CDC guidelines for disinfection. We need to have a formal position with respect to which disinfectants are effective, at what strength can they be used, and what are the absolutely essential standards for processing.

In each of the last two issues of the MMWR, CDC has carried articles with respect to dialysis issues. In neither case was the reference to the fact that the Public Health Service was undertaking an assessment. In the first of these, MMWR addressed the issue of exposure to formaldehyde by individuals engaged in reprocessing. Concern among employees of dialysis centers over exposure to formaldehyde is thought to be one of the issues stimulating the use of alternative disinfectants. In last Friday's MMWR, CDC reported on the current outbreaks, with an editorial note calling for more clinical studies. Again, there was no reference to other PHS efforts. Both of these publications will be seized upon by Senator Heinz's staff and used to criticize us.

During my testimony, we reported that HCFA and NIH has established a registry which would make it possible to look at issues affecting reuse. Apparently that information was not correct. There has not yet been a decision as to whether or not the registry will collect information on this issue, or whether it will be analyzed for this purpose.

On June 12 of this year, HCFA participated in a briefing of the Under Secretary prior to a meeting between the Under Secretary and representatives of the dialysis patients organization.- A briefing memo from HCFA to the Under Secretary is presently in clearance within the Department.

After the hearing, Dr. Macdonald directed me to carry out an assessment of dialyzer reuse. In the course of carrying out that assessment, it has become evident that communication within the Public Health Service is less than adequate. We uncovered serious omissions and inaccuracies in the testimony which had been prepared based on facts made available last March. Some of these only came to light the day before the comment period for the assessment expired, when we received several hundred pages of information from Senator Heinz. Included in that were internal PHS documents that had not previously been shared with us. On the strength of that, I requested an extension to July 10 for completing our report. However, the recent outbreaks of bacteremia, and additional information that has unfolded from that process, suggest that a report at this time might not be appropriate.

ACTION

The PHS needs to take a clinically and scientifically based stand with respect to this issue. We need to communicate that directly and emphatically to the Health Care Financing Administration, even if that means recognizing that our earlier testimony was flawed.

John E. Marshall, Ph D

JOHN HEINZ, PENNSYLVANIA, CHAIRMAN

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United States Senate
SPECIAL COMMITTEE ON AGING
WASHINGTON, DC 20510

August 7, 1986

The Honorable Robert E. Windom, M.D.
Assistant Secretary for Health
U.S. Public Health Service
U.S. Department of Health and
Human Services
Room 716G, Hubert H. Humphrey Bldg.
200 Independence Avenue, S.W.
Washington, D.C. 20201

Dear Bob:

I enjoyed our meeting on Monday. Our chat concerning future actions of the Public Health Service regarding the safety and efficacy of reusing dialysis devices was very helpful. I appreciate your commitment to provide the Committee on a continuing basis all documentation on PHS activities that impact on Medicare's end stage renal disease program (ESRD).

Following our meeting I learned of a matter that I felt should be brought to your attention immediately. It has to do with the report on reuse of disposable dialysis devices that was submitted to you yesterday by the National Center for Health Services Research and Health Care Technology Assessment (NCHSR/HCTA).

Knowing that you share my wish for this report to be thorough and complete, you will be disturbed to know, as I was, that the report lacks an analysis of available information and data that relates to deaths, serious injuries and poor reprocessing procedures in dialysis device reuse. Due to the relevancy and importance of these documents to the NCHSR/HCTA assessment, I am forwarding them to the NCHSR/HCTA as they become available to the Committee.

As an example, I am referring to such materials as the FDA's Establishment Inspection Reports (EIR's), which pertain to problems in reprocessing and reuse, Medical Device Reports, and the dialysis clinic survey reports from the States of Massachusetts and California that have a direct bearing on the NCHSR/HCTA assessment. According to NCHSR/HCTA, there was no time to analyze these materials because of the deadline set by your office for completion of the report.

I fear that failure by the NCHSR/HCTA to consider these very pertinent materials will result in a flawed assessment. Therefore, I think you will agree that it may be best to allow additional time to the NCHSR/HCTA in order to review the materials referred to above prior to your finalizing the assessment report.

Thank you for your cooperation and assistance in this important matter.

Sincerely,

JOHN HEINZ
Chairman

JH:jfm

JOHN HEINZ, PENNSYLVANIA, CHAIRMAN

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United States Senate
SPECIAL COMMITTEE ON AGING
WASHINGTON, DC 20510

August 8, 1986

Honorable John E. Marshall, Ph.D.
Director
National Center for Health Services Research
And Health Care Technology Assessment
U.S. Public Health Service
U.S. Department of Health and Human Services
Park Building, Room 310
Rockville, Md. 20857

Dear Dr. Marshall:

I am writing to share with you copies of Establishment Inspection Reports (EIRs) and attachments generated by the Food and Drug Administration. I believe that these EIRs are relevant and pertinent to the NCHSR/HCTA's assessment of the safety and efficacy of reprocessing and reuse of disposable dialysis devices.

As Jim Michie of the Committee staff informed you in his letter of August 2, 1986, I will be forwarding to you additional materials as soon as they become available. I hope you will find these documents helpful in completing your assessment.

Should you have any questions regarding the enclosed materials, please contact Mr. Michie at 224-5364.

Sincerely,

John Heinz

JOHN HEINZ
Chairman

Enclosures

JH:jfm

JOHN HEINZ, PENNSYLVANIA, CHAIRMAN

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United States Senate
SPECIAL COMMITTEE ON AGING
WASHINGTON, DC 20510

August 15, 1986

The Honorable Robert E. Windom, M.D.
Assistant Secretary for Health
U.S. Public Health Service
U.S. Department of Health and
Human Services
Room 716G, Hubert H. Humphrey Bldg.
200 Independence Avenue, S.W.
Washington, D.C. 20201

Dear Dr. Windom:

I am writing to share with you very distressing developments regarding the recently completed assessment of reuse of disposable dialysis devices by the National Center for Health Services Research and Health Care Technology Assessment (NCHSR/HCTA).

The Aging Committee's ongoing investigation into reprocessing and reuse of dialysis devices has revealed inexplicable activities within the Public Health Service (PHS) and the Health Care Financing Administration (HCFA). Specifically, I am referring to the abrupt termination on August 6, 1986 of the NCHSR/HCTA assessment, and HCFA's premature publication on August 15, 1986 of reductions in Medicare's dialysis reimbursement rates which will become effective on October 1, 1986.

As you know, HCFA relies very heavily upon NCHSR/HCTA's scientific and technological expertise in developing and finalizing its actions regarding administration of health care financing. I must assume that such was the case in HCFA's decision this week to proceed with the dialysis reimbursement reductions. Further, I must assume that HCFA relied upon the NCHSR/HCTA's draft assessment report submitted to you on August 6, 1986.

I deeply regret to inform you that the NCHSR/HCTA report is seriously flawed. The report lacks critically pertinent information concerning deaths, serious injuries, extremely poor reprocessing procedures in dialysis clinics, and numerous deficiencies in manufacturing practices of firms that market dialysis and reprocessing devices.

I was interested in your comment to me last Wednesday evening indicating that the information forwarded to NCHSR/HCTA by Committee staff had already been in their possession and had been fully considered. I am not sure how to reconcile this

The Honorable Robert E. Windom, M.D.
August 15, 1986
Page 2

with reports from NCHSR/HCTA that the assessment report was hastily finalized to meet the August 6 "deadline," without time to review and consider reams of very pertinent documentation, some of which Committee staff provided to NCHSR/HCTA on August 2 and August 10 and other materials that were provided to NCHSR/HCTA by the Department on August 11. It is my understanding that still more of this documentation has yet to be submitted by FDA to NCHSR/HCTA.

I plan to share this information with Secretary Bowen in the hope that he would consider immediate withdrawal of HCFA's dialysis reimbursement reductions, until NCHSR/HCTA has had sufficient time to complete its assessment so that HCFA can make an informed decision on the reimbursement issue.

In light of these findings, I very strongly urge you to permit NCHSR/HCTA time enough to perform a thorough and complete assessment drawing upon all available documentation on this vital subject.

Thank you for your cooperation and assistance in this important matter.

Sincerely,

John Heinz

JOHN HEINZ
Chairman

JH:jfm

JOHN HEINZ, PENNSYLVANIA, CHAIRMAN
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United States Senate
SPECIAL COMMITTEE ON AGING
WASHINGTON, DC 20510

August 15, 1986

The Honorable Otis R. Bowen, M.D.
Secretary of Health and Human Services
200 Independence Avenue, S.W.
Washington, D.C. 20201

Dear Mr. Secretary:

I am writing to share with you my recent findings concerning a grave injustice that is being done to Medicare's 80,000 dialysis patients who are threatened by recent actions within the Department of Health and Human Services.

The Aging Committee's ongoing investigation into reuse of disposable dialysis devices has revealed inexplicable and ill-conceived activities within the Public Health Service (PHS) and the Health Care Financing Administration (HCFA). Specifically, I am referring to the abrupt termination on August 6, 1986 of the assessment of reuse procedures by the National Center for Health Services Research and Health Care Technology Assessment (NCHSR/HCTA), and HCFA's premature publication on August 15, 1986 of reductions in Medicare's dialysis reimbursement rates, which will become effective on October 1, 1986.

As you know, HCFA relies very heavily upon NCHSR/HCTA's scientific and technological expertise in developing and finalizing its actions regarding administration of health care financing. I must assume that such was the case in HCFA's decision this week to proceed with the dialysis reimbursement rate reductions. Further, I must assume that HCFA relied upon the NCHSR/HCTA's draft assessment report that was submitted to the Assistant Secretary for Health, Robert E. Windom, M.D., on August 6, 1986.

I deeply regret to inform you that the NCHSR/HCTA report is seriously flawed. The report lacks critically pertinent information concerning deaths, serious injuries, extremely poor reprocessing procedures in dialysis clinics, and numerous deficiencies in manufacturing practices of firms that market dialysis and reprocessing devices.

The Committee's investigation has determined that the NCHSR/HCTA staff was forced to hastily finalize the report in order to meet the August 6 "deadline." This, without their having had the time to review and consider reams of this very pertinent documentation, some of which Committee staff provided to NCHSR/HCTA on August 2 and August 10. Additional such materials were provided to NCHSR/HCTA by DHHS on August 11. It is my understanding that still more of this documentation has yet to be submitted by FDA to NCHSR/HCTA.

Assuming that HCFA relied upon the seriously deficient NCHSR/HCTA assessment report to make a final decision on the reimbursement rate reductions, one can only conclude that HCFA's decision process was flawed.

In light of these very distressing and shocking developments, I very strongly urge you again to take a personal interest in these matters which affect the safety and well-being of all dialysis patients. Specifically, I urge you to consider immediate withdrawal of the dialysis reimbursement reductions until NCHSR/HCTA has had sufficient time to evaluate the materials cited above for inclusion in its final assessment report and recommendations.

Thank you for your cooperation and assistance in this important matter.

Sincerely

John Heinz

JOHN HEINZ
Chairman

JH:jfm

THE SECRETARY OF HEALTH AND HUMAN SERVICES
WASHINGTON, D.C. 20201

AUG 18 1986

The Honorable John Heinz
Chairman
Special Committee on Aging
United States Senate
Washington, D.C. 20510

Dear Mr. Chairman:

This is in further response to your correspondence concerning the Medicare payments for dialysis treatment. In developing the August 15, 1986 Federal Register final notice on rates for dialysis services, we considered carefully the issues you raised. We believe that the final notice goes far in responding to the concerns that we believe underlie the requests in your correspondence. A copy of the notice is enclosed for your information.

It is significant that the payment rates in the final notice are higher than those that were proposed. For example, the final base rate for free-standing facilities is $115.62 per treatment, and for hospital facilities it is $121.76. In contrast, the proposal would have set the base rate at $113.47 per treatment, and $117.89 per treatment for free-standing and hospital-based facilities, respectively. The rates in the final notice are much closer to those in the Ways and Means reconciliation bill. The Ways and Means bill sets rates at $117.50 per treatment in free-standing facilities, and $121.50 per treatment in hospital-based facilities. Thus, the base rates for hospitals in the August 15 Federal Register notice are slightly higher than the Ways and Means bill while the rates for free-standing facilities remain somewhat lower.

As you know, we share your concerns about quality of care and access to services. To help assure quality of care, the National Center for Health Services Research in the Public Health Service has recently completed a technology assessment on the subject of reuse and reprocessing of disposable dialysis devices. The findings to date indicate that when physicians and facilities exercise appropriate quality control over reprocessing of dialyzers, and adequate disinfecting, washing and rinsing of related components is practiced, patient outcomes appear to be no different in facilities that reuse dialyzers than for those facilities where single use is the normal operating mode. While there is evidence of a relationship between improper reprocessing and outbreaks of bacteremia/sepsis, these appear to represent isolated events. The absence of reported increases in the morbidity and mortality given increased practice of reuse suggests that virtually all facilities are following adequate procedures. The assessment also found variation in the reprocessing practices and concludes that the need exists for further study from which, if indicated, additional guidelines can be developed to assure optimal safety and clinical efficacy of dialysis, whether under single use or multiple use conditions.

The Centers for Disease Control, the National Institutes of Health, and the Food and Drug Administration in the Public Health Service are currently reviewing the findings of the technology assessment of reuse and reprocessing with a view toward identification of appropriate next steps. I have been assured by Dr. Robert E. Windom, Assistant Secretary for Health, that in conjunction with his analysis of the NIH, CDC and FDA responses to the PHS technology assessment, he will also consider the concerns expressed in your letters of July 18 and 23. Should this review reveal the need for further actions by either the Public Health Service or the Health Care Financing Administration, the Department will act promptly.

In regard to the access to care issue, there is a special provision in the dialysis payment regulations for isolated, essential facilities. We invite small, rural facilities that cannot take advantage of economies of scale to apply for this exception if the new Medicare payment rate is less than their costs. We are initiating a policy that exception requests under this category will be processed on a priority basis with a view toward protecting patients' access to care and assuring adequate payment to small, essential facilities.

The rates are based on audited cost data which are the best, most current data available. While it is true that the data are based on costs incurred in 1982 and 1983, there is no evidence that the overall cost of furnishing dialysis has followed general inflation. Furthermore, on July 22, 1986 at the request of the Subcommittee on Health, Committee on Ways and Means, the General Accounting Office (GAO) issued a report (GAO/HRD-86-126BR) on the proposed dialysis rates. The report stated that HHS used the most recent data available to develop the proposed rates and used the data appropriately. The report also concluded that the use of more recent data could show lower costs and result in lower rates than those proposed. GAO noted that a number of comments on the proposed dialysis rates alluded to costs decreases since the implementation of composite rates for dialysis payments in 1983. We will continue to monitor the cost of furnishing dialysis. For example, we are conducting a national audit of dialysis facilities' cost this year.

I appreciate your providing me with your views on these important matters. If you wish to discuss this change in dialysis payments further, please contact Dr. William Roper, M.D., who is the new Administrator of the Health Care Financing Administration.

A response has been sent to the other signers of your June 26, 1986 letter.

Sincerely,

Otis R Bowen

Otis R. Bowen, M.D.
Secretary

Enclosure

THE SECRETARY OF HEALTH AND HUMAN SERVICES
WASHINGTON, D.C. 20201

AUG 18 1986

The Honorable John Glenn
United States Senate
Washington, D.C. 20510

Dear Senator Glenn:

This is in response to your letter of June 26, 1986 concerning the Medicare payments for dialysis treatment. In developing the August 15, 1986 Federal Register final notice on rates for dialysis services, we considered carefully the issues raised in your letter. We believe that the final notice goes far in responding to the concerns that we believe underlie the requests in your letter. A copy of the notice is enclosed for your information.

It is significant that the payment rates in the final notice are higher than those that were proposed. For example, the final base rate for free-standing facilities is $115.62 per treatment, and for hospital facilities it is $121.76. In contrast, the proposal would have set the base rate at $113.47 per treatment, and $117.89 per treatment for free-standing and hospital-based facilities, respectively. The rates in the final notice are much closer to those in the Ways and Means reconciliation bill. The Ways and Means bill sets rates at $117.50 per treatment in free-standing facilities, and $121.50 per treatment in hospital-based facilities. Thus, the base rates for hospitals in the August 15 Federal Register notice are slightly higher than the Ways and Means bill while the rates for free-standing facilities remain somewhat lower.

As you know, we share your concerns about quality of care and access to services. To help assure quality of care, the National Center for Health Services Research in the Public Health Service has recently completed a technology assessment on the subject of reuse and reprocessing of disposable dialysis devices. The findings to date indicate that when physicians and facilities exercise appropriate quality control over reprocessing of dialyzers, and adequate disinfecting, washing and rinsing of related components is practiced, patient outcomes appear to be no different in facilities that reuse dialyzers than for those facilities where single use is the normal operating mode. While there is evidence of a relationship between improper reprocessing and outbreaks of bacteremia/sepsis, these appear to represent isolated events. The absence of reported increases in the morbidity and mortality given increased practice of reuse suggests that virtually all facilities are following adequate procedures. The assessment also found variation in the reprocessing practices and concludes that the need exists for further study from which, if indicated, additional guidelines can be developed to assure optimal safety and clinical efficacy of dialysis, whether under single use or multiple use conditions.

The Centers for Disease Control, the National Institutes of Health, and the Food and Drug Administration in the Public Health Service together with Dr. Robert E. Windom, Assistant Secretary for Health, are currently reviewing the findings of the technology assessment of reuse and reprocessing with a view toward identification of appropriate next steps. Should this review reveal the need for further actions by either the Public Health Service or the Health Care Financing Administration, the Department will act promptly.

In regard to the access to care issue, there is a special provision in the dialysis payment regulations for isolated, essential facilities. We invite small, rural facilities that cannot take advantage of economies of scale to apply for this exception if the new Medicare payment rate is less than their costs. We are initiating a policy that exception requests under this category will be processed on a priority basis with a view toward protecting patients' access to care and assuring adequate payment to small, essential facilities.

The rates are based on audited cost data which are the best, most current data available. While it is true that the data are based on costs incurred in 1982 and 1983, there is no evidence that the overall cost of furnishing dialysis has followed general inflation. Furthermore, on July 22, 1986 at the request of the Subcommittee on Health, Committee on Ways and Means, the General Accounting Office (GAO) issued a report (GAO/HRD-86-126BR) on the proposed dialysis rates. The report stated that HHS used the most recent data available to develop the proposed rates and used the data appropriately. The report also concluded that the use of more recent data could show lower costs and result in lower rates than those proposed. GAO noted that a number of comments on the proposed dialysis rates alluded to costs decreases since the implementation of composite rates for dialysis payments in 1983. We will continue to monitor the cost of furnishing dialysis. For example, we are conducting a national audit of dialysis facilities' cost this year.

I appreciate your providing me with your views on these important matters. If you wish to discuss this change in dialysis payments further, please contact Dr. William Roper, M.D., who is the new Administrator of the Health Care Financing Administration.

A response has been sent to the other signers of your letter.

Sincerely,

Otis R Bowen

Otis R. Bowen, M.D.
Secretary

Enclosure

federal register

Friday
August 15, 1986

Part VI

Department of Health and Human Services

Health Care Financing Administration
Medicare Program; End-Stage Renal Disease Program; Composite Rates and Methodology for Determining the Rates; Final Notice

DEPARTMENT OF HEALTH & HUMAN SERVICES

Office of the Secretary

Washington, D.C. 20201

August 22, 1986

The Honorable John Heinz
Chairman, Special Committee
on Aging
United States Senate
Washington, D.C. 20510

Re: Investigation of Hemodialyzer Reuse

Dear Mr. Chairman:

At the outset let me emphasize that we wish to cooperate fully with you in your review of issues relating to hemodialyzer reuse. To that end we have expended considerable resources identifying and producing for your staff a large volume of pertinent materials collected from various components of this Department. In addition, HHS personnel have spent substantial amounts of time discussing this matter with your staff.

However, the approach recently taken in this matter -- i.e. issuing subpoenas purporting to require Department employees to appear before your staff to give testimony in this matter -- is in our view virtually without precedent and clearly unwarranted. Therefore, on the advice of counsel, we will proceed as follows. We will produce the individuals who have currently been subpoenaed at the time and place agreed upon with the understanding that (1) such individuals are appearing and will give testimony strictly on a voluntary basis, (2) they are not appearing pursuant to compulsory process, and (3) all such persons shall be accompanied by counsel.

Finally, let me reiterate and clarify the Department's position with respect to all requests by your staff for any documents or interviews with any employee of this Department pertaining to this matter. All such requests are to be made directly to me personally, or in the event I am not available to Ms. Patricia Knight of my staff. Either Ms. Knight or I will then make arrangements for appointments or document production. In order to assure an orderly process, provision of accurate information, and appropriate record-keeping, we must insist that all requests for information be made by letter, indicating the specific material which is requested. We have instructed all relevant personnel of this Department to adhere to this procedure which in our view is mandatory to assure full cooperation with the committee in a manner that does not unnecessarily disrupt the important work of the Department.

Page two

In summary, the Department remains willing to fully cooperate voluntarily with your staff, through meetings, provision of documents, and in any other way we can be helpful consistent with the approach I have outlined above.

Sincerely,

Ronald F. Docksai
Assistant Secretary for Legislation

cc: James Michie,
Chief Investigator

JOHN HEINZ, PENNSYLVANIA, CHAIRMAN

WILLIAM S. COHEN, MAINE
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STEPHEN R. McCONNELL, STAFF DIRECTOR
DIANE LIFSEY, MINORITY STAFF DIRECTOR

United States Senate
SPECIAL COMMITTEE ON AGING
WASHINGTON, DC 20510

August 28, 1986

Mr. Richard J. Riseberg
Chief Counsel
U.S. Public Health Service
U.S. Department of Health and
  Human Services
Parklawn Building, Room 4A53
5600 Fishers Lane
Rockville, Md. 20857

Dear Mr. Riseberg:

I have reviewed transcripts of the appearance of your clients, Drs. John E. Marshall and Enrique D. Carter and Mr. Martin N. Erlichman, at depositions of the Special Committee on Aging on August 22 and August 26, 1986. I have noted your clients' refusals to take the oath that Committee Rule 6.3 provides for the court reporter/notary public to administer at the outset of a deposition.

Based on the remarks of your clients and yourself at these depositions, I understand your clients to have raised two objections. First, you have questioned the legitimacy of the Committee's issuance of subpoenas directing witnesses to be examined by Committee staff at deposition, without the presence of Members of the Committee. Second, you have questioned the authority for an oath to be administered at a Committee deposition by anyone who is not a Member of Congress.

I request that you communicate to your clients that, upon consideration of these two objections, as Chairman of the Committee, I have overruled both objections. First, section 104(c)(1) of Senate Resolution 4 explicitly authorizes the Committee to require the attendance of witnesses by subpoena and to take depositions. Your apparent contention that the deposition authority does not authorize depositions by Committee staff is incorrect. The word "deposition," in contrast to the word "hearing," refers to examination by staff only. This interpretation of the word "deposition" is the only interpretation that is consistent with well-established congressional practice as well as the common meaning of the word in extra-congressional legal contexts. I rule that the Senate has authorized the Committee to subpoena witnesses to testify at depositions conducted by Committee staff.

Second, Committee Rule 6.3, which provides for the administration of oaths at staff depositions by "an individual authorized by local law to administer oaths," is consistent with governing legal authority. Your contention that section 104(c)(2) of Senate Resolution 4, which authorizes the Chairman or any Member of the Committee to administer oaths, precludes a notary public from administering an oath at deposition is incorrect. Section 2903(c) of title 5 of the U.S. Code, in concert with section 104(c)(1)(G) of Senate Resolution 4, pursuant to the Senate's constitutional rule-making power, authorizes administration of oaths to witnesses at Committee staff depositions by individuals authorized by local law to administer oaths. Accordingly, I rule that your clients are required to take an oath to be administered by any individual designated by the Committee staff who is authorized to administer oaths by local law.

I would appreciate your advising each of your clients who has refused to be examined by Committee staff at deposition under an oath to be administered by a notary public of my rulings on their objections. If Drs. Marshall and Carter and Mr. Erlichman remain unwilling to comply with the requirements of the subpoenas with which they have been served, subpoenas may be issued compelling their attendance at a hearing of the Committee in order for them to show cause why they should not be held in contempt of Congress. Please advise Mr. James P. Michie, Chief Investigator for the Special Committee on Aging, and Mr. Morgan Frankel of the Office of Senate Legal Counsel, of your clients' intentions.

Sincerely,

John Heinz

JOHN HEINZ
Chairman

JOHN HEINZ, PENNSYLVANIA, CHAIRMAN

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United States Senate
SPECIAL COMMITTEE ON AGING
WASHINGTON, DC 20510

September 3, 1986

James S. Benson
Deputy Director, Center for
Devices and Radiological Health
Food and Drug Administration
U.S. Public Health Service
Rockville, MD

Dear Mr. Benson:

Pursuant to the wishes of Donald Newman, Under Secretary for the Department of Health and Human Services, I am requesting in writing that you bring with you today for reference during your deposition your appointment calendars for 1986, the briefing book prepared for the Aging Committee's March 6, 1986 hearing on dialysis device reuse, and the materials which I culled from files provided to me for review by the Center for Devices and Radiological Health on August 29, 1986.

These materials are essential to the conduct of your deposition.

Thank you for your cooperation and assistance in this matter.

Sincerely,

James F. Michie

James F. Michie
Chief Investigator

JM:ds

JOHN HEINZ, PENNSYLVANIA, CHAIRMAN

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STEPHEN R. McCONNELL, STAFF DIRECTOR
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United States Senate
SPECIAL COMMITTEE ON AGING
WASHINGTON, DC 20510

September 5, 1986

Honorable Ronald F. Docksai
Assistant Secretary for Legislation
U. S. Department of Health and
Human Services
200 Independence Avenue, S.W.
Washington, D.C. 20201

Dear Mr. Docksai:

Pursuant to the wishes of Donald Newman, Under Secretary for the Department of Health and Human Services (DHHS), I am requesting in writing that you provide certain documentation and materials pertaining to the Aging Committee's ongoing investigation of the safety, efficacy, and cost implications of the reprocessing and reuse of dialysis devices.

Specifically, I am requesting that you provide at your earliest convenience any and all documents, data and records which have been generated and/or received by officials and personnel within DHHS that pertain to any and all aspects of dialysis device reprocessing and reuse, and that DHHS has yet to provide to the Aging Committee.

Further, I am requesting that you continue to provide these materials on an incremental basis and as they are generated within the Department of Health and Human Services; and that all individuals within DHHS who have been, or may be in the future, subpoenaed for sworn deposition concerning this matter, be permitted to bring materials with them for reference during deposition, including, but not limited to, their appointment calendars, logs and diaries.

Thank you for your continuing cooperation and assistance in this important matter.

Sincerely,

Stephen R. McConnell
Staff Director

DEPARTMENT OF HEALTH & HUMAN SERVICES

Office of the Secretary

Washington, D.C. 20201

September 8, 1986

Mr. Stephen R. McConnell
Staff Director
United States Senate
Special Committee on Aging
Washington, D.C. 20510

Dear Steve:

I thank Jim Michie and yourself once again for our meeting in your office last Friday, September 5. In doing so, I also respond to your letter to me dated September 5 which I received from you during our get-together.

On behalf of our Department, the HHS Office of Legislation will continue to do all that we can to comply with the legislative oversight requests of Senator Heinz, as we do for all Members of Congress. Since our meeting, I spoke with the HHS Under Secretary, Don Newman, about your and Jim's special concerns. As you know, we share your sense of urgency concerning the important subject of dialysis device reprocessing and reuse.

Our mutual concern is reflected in the recent establishment of the PHS Interagency Task Force on Dialyzer Reuse by our Assistant Secretary for Health, Dr. Robert Windom, M.D. As the Task Force completes the course of its ambitious work schedule, i.e., a copy of which I gave you last Friday, we will keep you fully informed of its progress.

Meanwhile, the HHS Office of Legislation will continue to make available to you the information you officially request during the course of Senator Heinz's inquiry. In order that we can do so thoroughly as well as expeditiously, I remind you of our procedural requirement for specificity as you request particular documents, data and records, et al. The Deputy Assistant Secretary for Health Policy in the Office of Legislation, Patricia Knight, is ready and able to assist your document search as you provide her with specific written requests for the items you more generally characterize in your September 5 letter.

As a former Senate committee staff director, I am the first to appreciate the merciless time pressures enjoyed by Members and staff during these final days of a congressional session. If you think of ways I or the other members of my staff can lend you some relief in the legislative days remaining, please let me know. I look forward to seeing you again very soon.

As always,

Ronald F. Docksai
Assistant Secretary for Legislation

DEPARTMENT OF HEALTH & HUMAN SERVICES
Public Health Service
Washington DC 20201

SEP 5 1986

Request that Member be placed on this Task Force

The Honorable John Heinz
Chairman
Special Committee on Aging
Washington, D.C. 20510

Dear Senator ~~Heinz~~: John

In light of your concerns about the reuse of hemodialysis devices, I felt that you may want to know the actions that the PHS has recently undertaken with regard to this issue.

I have established the Interagency Task Force on Dialyzer Reuse to advise me with respect to issues related to hemodialyzer reuse. Specifically, the Task Force will review the NCHSR/HCTA recommendations, provide thoughtful consideration of appropriate PHS actions, develop an implementation plan, and monitor the progress of this plan. In addition, this group will provide a focal point for discussion of dialysis issues within the PHS on a continuing basis, provide advice to me and other senior PHS officials, and, as necessary, to other components of the Department.

The Task Force is chaired and staffed by members of my immediate office and also consists of senior representatives from the National Institutes of Health, the Centers for Disease Control, and the Food and Drug Administration, the National Center for Health Services Research/Health Care Technology and the Chief Counsel of the Public Health Service.

I have enclosed a copy of the Charter for the Task Force, its membership roster, and a copy of the draft workplan. At the first meeting on September 4, I gave the group its charge and impressed upon them the importance of their work. I expect to have a PHS implementation plan from this group no later than October 24.

I wish to thank you for you for your continued interest in this important health matter, and will keep you apprised of our progress.

Sincerely yours,

Bob

Robert E. Windom, M.D.
Assistant Secretary for Health

Enclosures

Public Health Service

INTERAGENCY TASK FORCE ON DIALYZER REUSE

CHARTER

Purpose

The PHS Interagency Task Force on Dialyzer Reuse, herein referred to as the Task Force, is established by the Assistant Secretary for Health, DHHS, as an interagency group to:

A. provide a focal point for dialyzer reuse issues within PHS;

B. advise the Assistant Secretary for Health with respect to the recommendations emanating from the NCHSR/HCTA assessment on dialyzer reuse entitled "Public Health Service Assessment: The Reuse of Hemodialysis Devices Labeled for 'Single Use Only'", dated August 6, 1986;

C. develop an implementation plan based upon those recommendations agreed to by the Assistant Secretary for Health; and

D. monitor progress of the PHS agencies with regard to progress of the implementation plan.

Scope

To ensure that the Task Force's purpose is carried out, the Task Force will undertake activities that include, but are not limited to, the following:

A. evaluate the recommendations of the NCHSR/HCTA assessment and advise the Assistant Secretary for Health on those recommendations that should be pursued by PHS;

B. establish a PHS Implementation Plan which will identify lead responsibilities within PHS for each of the recommendations accepted by the Assistant Secretary for Health and establish appropriate timetables;

C. monitor the progress of the PHS agencies in the fulfillment of the goals of the implementation plan; and

D. provide advice, on a continuing basis, to the Assistant Secretary for Health, other senior PHS officials, and, at the direction of the Assistant Secretary for Health, other components of the Department on issues related to dialyzer reuse.

Structure

The Task Force will be chaired by the Deputy Director, Office of Health Planning and Evaluation. The Chairman will be assisted by an Executive Secretary.

The members of the Task Force shall consist of a senior representative from each of the following PHS agencies: National Institutes of Health, the Centers for Disease Control, and the Food and Drug Administration. Participants will be designated by the heads of the agencies represented on the Task Force.

In addition, the Director of the National Center for Health Services Research/Health Care Technology Assessment and the Chief Counsel of the Public Health Service, or their designees, shall also be appointed as members of the Task Force. Any necessary resources and staff support needed by the members of the Task Force shall be provided by each of the member agencies or offices.

Meetings

It is expected that the Task Force shall meet regularly, but not less often than quarterly. There will be a need to meet more frequently in the initial phase of the Task Force deliberations. The schedule of meeting dates will be determined by the Chairman, in consultation with the Task Force members.

Reporting

The Task Force shall provide reports on its activities to the Assistant Secretary for Health at least quarterly or more often as necessary.

Duration

The duration of the Task Force shall be eighteen (18) months from the date of approval of this charter. At that time, the Assistant Secretary for Health will evaluate whether the charter for this Task Force should be extended.

Robert E. Windom, M.D.
Assistant Secretary for Health

SEP 3 1986

Date

INTERAGENCY TASK FORCE ON DIALYZER REUSE

ROSTER

James Friedman (Chairman)
Deputy Director,Office of Health
Planning and Evaluation, OASH
Humphrey Building, Room 403-B
200 Independence Avenue
Washington, D.C. 20201
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Richard J. Riseberg
Chief Counsel, Public Health Service
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Director, Division of Kidney, Urologic and
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Valerie P. Setlow, Ph.D.(Executive Secretary)
Senior Health Policy Analyst, Office of
Health Planning and Evaluation, OASH
Humphrey Building, Room 403-B
200 Independence Avenue
Washington D.C.
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DRAFT

INTERAGENCY TASK FORCE ON DIALYZER REUSE

MASTER SCHEDULE AND WORK PLAN

Date	Action
September 3	Interagency Task Force on Dialyzer Reuse established by the Assistant Secretary for Health
September 4	First meeting of the Task Force
	Charge to the Task Force by the ASH
	Review of the Task Force Charter
	Review and Agree on Work Plan
	Assign Lead Agencies for Discussion of NCHSR/HCTA Assessment Recommendations
	Distribute Agency Comments on NCHSR/HCTA Assessment to all Task Force Members
September 12	Second meeting of the Task Force
	Discussion of Agency Comments on NCHSR/HCTA Assessment
	Discuss and Reach Consensus on Proposed PHS response to NCHSR/HCTA Assessment Recommendations
September 16	Draft sections of "Advice Memo" due to Task Force Executive Secretary from Task Force Members
	Collated Version Distributed to Task Force Members
September 19	Third Meeting of the Task Force
	Final review of Advice Memo to ASH on proposed PHS response to NCHSR/HCTA Recommendations
	Discuss Identification of Lead Agency for Implementation of Recommendations Proposed
	Begin Discussion of Implementation Steps and Appropriate Time Tables
September 23	* **PROGRESS REPORT TO ASH:** Advise ASH on Proposed PHS Actions on Dialyzer Reuse
September 23	Task Force Members provide Implementation Proposals and Time Frames for Distribution

September 26	Fourth Meeting of the Task Force Discuss and Reach Consensus on Implementation Proposals and Time Tables provided by Lead Agencies Consolidate Agency Plans to Draft the PHS Implementation Plan for Dialyzer Reuse Activities HCFA representatives will be invited if appropriate
September 30	Distribute Draft Implementation Plan to Task Force Members
October 3	Fifth Meeting of the Task Force Final Review of PHS Implementation Plan on Dialyzer Reuse Agreement Reached on Tracking System necessary to Monitor Progress
October 10	* **REPORT TO THE ASH:** Implementation Plan for PHS Activities Recommended on Dialyzer Reuse
October 9/17	Sixth Meeting of the Task Force Chairman reports on the ASH comments to the PHS Implementation Plan Revise Implementation Plan as necessary Finalize Tracking System Discussion of schedule for forthcoming meetings

THE SECRETARY OF HEALTH AND HUMAN SERVICES
WASHINGTON D.C. 20201

SEP 18 1986

The Honorable John Heinz
Chairman
Special Committee on Aging
United States Senate
Washington, D.C. 20510

Dear Mr. Chairman:

This is in response to your letter of August 15, 1986 regarding dialysis services. As indicated in my August 18 letter to you, we share your concerns about quality of care and access to services.

We are continuing our review of the National Center for Health Services Research's technology assessment on the subject of reuse and reprocessing of disposable dialysis devices and will take into account the concerns you have raised. In this regard, Robert E. Windom, M.D., the Assistant Secretary for Health, has put into place a task force to advise him on appropriate implementation actions. We will continue to keep you advised as to the progress of our review and any findings that we believe warrant your attention.

Regarding Medicare payment for dialysis services, the notice on the facilities' composite rate payments proposed a payment reduction commensurate with the best and most recent audited data available for the cost of furnishing dialysis services. These data are based on the cost experience of a cross-section of all dialysis facilities in the country as of November 1982. Therefore, the composite rates mirror medical practice in the dialysis community, including the reuse of dialyzers. In response to a request by the House Ways and Means Subcommittee on Health, the General Accounting Office reviewed the notice and a sample of public comments and supported the data and their use in a July 22, 1986 report (GAO/HRD-86-125BR).

However, as you know after considering the public comments we decided to modify the proposal in the final notice published in the Federal Register on August 15, 1986. The final payment rates are higher than the proposed rates, and are much closer to the rates in the Ways and Means reconciliation bill. The rate for hospitals in the final notice ($121.76) is slightly higher than in the Ways and Means bill ($121.50), while the rate for independent facilities ($115.62) remains somewhat lower ($117.50). In addition, the Health Care Financing Administration will continue to monitor the program closely to ensure that access to and quality of dialysis care is maintained.

You can be assured that we are very mindful of our responsibility to assist in the financing of this essential medical treatment. However, we also have a responsibility to promote the most efficient program that we can, and pay for these services at a rate commensurate with the cost of furnishing them. We have considered this issue carefully. Therefore, we believe it would not be in the best interest of the program to withdraw the composite rate regulations at this time.

Sincerely,

Otis R. Bowen, M.D.
Secretary

APPENDIX III.

INTERNAL DOCUMENTS FROM FEDERAL AGENCIES PERTAINING TO THE REUSE OF DISPOSABLE DEVICES

Arthur D Little, Inc [illegible]

October 9, 1981

Norman Deane, M.D.
National Nephrology Foundation, Inc.
40 East 30th Street
New York, NY 10016

Dear Dr. Deane: Re: Contract No. NO1-AM-9-2214

As you know, the final report on the subject contract, "Multiple Use of Hemodialyzers," dated June 1981, was prepared by the Manhattan Kidney Center, printed and submitted to the NIAMKDD without benefit of review at Arthur D. Little, Inc. (ADL). The report contained data and text taken from our report to the National Nephrology Foundation, Inc., (NNF), "The In-Vitro Evaluation of Certain Issues Related to the Multiple Use of Hemodialyzers," dated February 1981, prepared under subcontract. While reference was made to the subcontract report, the material selected has been edited, supplemented and interpreted by you, your staff and others.

In these circumstances, we suggested it would be helpful for us to review the final report. Dr. Wineman asked that we summarize any substantive comments in a letter. We have confined ourselves to issues relating to our work, and particularly to any conclusions which appear to be based on our data. Clearly, however, the interpretations and conclusions presented in the final report to NIAMKDD are those of the National Nephrology Foundation and not of Arthur D. Little, Inc.

In general, we believe the report fails to make clear where material referenced to ADL's and other authors' work begins and ends. Also, we urge that conclusions which could be applied to clinical practice, such as those relating to the concentration of formaldehyde used for sterilization, be substantiated where appropriate by clinical trials, as was envisaged in the original request for proposal for this assignment.

The final report omits most of the limitations which attended data and statistical statements in the ADL report, for those ADL-generated data and statements which were selected. In particular, the final report tacitly asserts that the dialyzers which NNF submitted to ADL for testing were sufficient in number and representation to permit conclusive statistical comparisons. The ADL report makes no such assertion, and in fact advises in several places that "more extensive testing be performed to substantiate" its qualified findings.

October 9, 1981

-2-

Norman Deane, M.D.
National Nephrology Foundation, Inc.

There are a number of tables presenting data or statistical conclusions in the NNF report which are attributed to the ADL report when in fact the tables, either in total or in part, are not derived from the ADL report. These are addressed in the comments which follow.

Since our report to the NNF is a major reference, we hope that it, this letter, and the attached comments will be made readily available to those receiving copies of the final report.

Very truly yours,

John M. Ketteringham
Vice President

s
Attachment (1) 4 pages

cc: Dr. Robert J. Wineman
National Institutes of Health

Sylvan Nathan, Esq.
Nathan & Nathan

Arthur D Little, Inc

COMMENTS ON "MULTIPLE USE OF HEMODIALYZERS"

Page	Paragraph	Comment
4	1	The data in the report (see Figures 5, 6A, 6B, 7A, 7B, 8 and 9) shows that clearance values steadily fall as cell volume is reduced. This relationship is analyzed. It is not accurate to say that, "functional aspects of the dialyzers are maintained until there is a reduction of cell volume of approximately 60%."
	2	The predictive precision of the relationship is not given.
6	2	We believe that any change in clinical sterilization practice must be supported by adequate clinical studies.
8	2,3	We believe that clinical studies are required to substantiate this conclusion.
42	Table 8	ADL did not calculate the means reported in this table, as ascribed.
43	Table 9	ADL did not perform the statistical comparisons S vs. N and C vs. N described in this table, as ascribed. Moreover, the means for C (urea; simple), C (inulin; simple) and C (inulin; complex) do not coincide with those in the ADL report.
45	Table 1	The data for dialyzer "4" presented in the ADL report, p. 40, has been omitted. While this dialyzer showed a reduction of cell volume to 62 ml after only one use, measurements of clearance were consistent with this value.
46	Table 11	ADL did not perform the statistical comparisons in this table, as ascribed.
47	Table 12	ADL did not calculate the means reported in this table, as ascribed.
48	Table 13	ADL did not perform the statistical comparisons of ultra filtration reported in this table, as ascribed.

COMMENTS ON "MULTIPLE USE OF HEMODIALYZERS" (Continued)

Page	Paragraph	Comment
49	3,4	Since problems with mass balance closure have been endemic to studies of this kind, it would be helpful to have more complete data presented. Also, was the apparatus exactly the same as used at ADL and described in Appendices 7 and 8?
51	1	Data omitted from Table 1, page 45, indicates that "dialyzer function" is not always maintained after single use.
	2,3	See comment on p. 4.
53-62		Since this analysis uses data from ADL, a more direct reference would seem appropriate.
72	Table 16	ADL did not perform the statistical comparisons in this table, as ascribed.
73	Table 17	ADL did not perform the statistical comparisons in this table, as ascribed.
102	1	Incubation of antimicrobials with test organisms was done in test tubes not in Petri dishes.
107	3	The pour plate method can be used reliably after 10-fold or more dilution of 0.2% formaldehyde or with no dilution of samples containing 0.2% glutaraldehyde, 0.8% Betadine or 0.02% peracitic acid (See Table on p. 218 of Appendix 10).
108	2	Formaldehyde at 0.05% produced a 6-log kill of Pseudonomas aeruginosa after 5 and 24 hours; however, 0.1% formaldehyde was required to obtain a 6-log kill of Escherichia coli after 5 and 24 hours. Note that the data point at 5 hours for 0.05% formaldehyde in panel A of Figure 33 was plotted incorrectly when this figure was transcribed from ADL Report Figure 17, page 76. The 5 hour CFU/ml was about 1.8×10^5, not 1×10^0.
108	Table 27	Missing data points in this table can be obtained from Figures 30-33, i.e.: Formaldehyde vs. E. coli, 0.1% Formaldehyde vs. Staph aureus, 0.2% Glutaraldehyde vs. C. albicans 0.2% Betadine vs. E. coli 0.2%, not 0.8%.

C. Colton - private communication

COMMENTS ON "MULTIPLE USE OF HEMODIALYZERS" (Continued)

Page	Paragraph	Comment
109	Table 28	Incomplete set of data. See Table 21, page 85 of ADL report.
110	Figure 30	Vertical axes should read CFU/ml not cells/ml. The smallest number on the vertical axes which are a log scale should read 1×10^0 not 0.
111	Figure 31	Same as Figure 30.
112	Figure 32	Same as Figure 30.
113	Figure 33	Same as Figure 30. Also note in Panel A show data point for 5 hour 0.05% formaldehyde is 1.8×10^5 - not 1×10^0.
114	Table 29	Table 29 (studies not conducted at ADL) is presented before it is discussed in Section 2 at the bottom of the page and could be mistakenly attributed to ADL.
118	1	Table 28 should read Table 30.
120	2	The results discussed were obtained in in vitro experiments. Exposure of test organisms was done in test tubes not in Petri dishes; assay for survivors was done in Petri dishes.
121	1	We believe clinical trials are needed to confirm the in vitro test results of sterilant concentrations.
122	2	The apparent discrepancy of potency of Betadine noted by Favero et al. (Ref 68, which is a personal communication to Dr. Deane) might also be explained if Favero's experiments had been conducted in the absence of protein. Note that the ADL in vitro studies were done in the presence of a protein load (Appendix 10, page 214).
122	3	Although this does not refer to work performed at ADL, note that 0.2μ filters are referred to as 0.22 "mcg" filters. No data are presented to support the statement that "A comparison of results obtained by the pour plate method and the membrane filter technique, however, did not demonstrate consistently higher counts when the pour plate method was again used with P. aeruginosa taken directly from an agar slant."

COMMENTS ON "MULTIPLE USE OF HEMODIALYZERS" (Continued)

Page	Paragraph	Comment
124	3	Table 28 should read "Table 30."
125	2	Note the para "5" is para "4" — no data is presented.
126	1	Data with artificially inoculated dialyzers in the ADL report which are not incorporated in the NNF report address this point. See pages 86-99 of the ADL report, especially the last paragraph of the discussion on page 99. These conclude that the experimental sterilization procedure (involving 0.2% formaldehyde) might fail to attain a six-log Staph aureau "flush and kill" for certain used Travenol 1200 dialyzers.

DEPARTMENT OF HEALTH & HUMAN SERVICES

Public Health Service

Office of the Assistant Secretary
for Health
Washington DC 20201

2/19/86

NOTE TO DR. MACDONALD
THROUGH: Steven Grossman

SUBJECT: Background for Meeting of 2/19/86 on Dialyzer Reuse

FROM: Marcy Lynn Gross, DPA, OHPE

An investigator (Jim Michie) from Senator Heinz's Special Committee on Aging is looking at the dialyzer reuse issue and talking to a number of people in the Department. The purpose of Wednesday's meeting with Dr. Macdonald is to inform him about the Heinz investigation and to discuss activities underway in PHS and elsewhere that are related to dialyzer reuse. In addition, the legislative staff feels that Dr. Macdonald may wish to consider appointment of a special lead person on the issue, recommend establishment of a task force, or take some other anticipatory action. The legislative staff expect the Department to be called for testimony in a month or so, with no consensus yet in sight on the scientific or financing issues involved. They also expect the topic to generate continuing controversy among outside groups.

Agencies Involved in the Reuse Issue

FDA At present, FDA does not officially approve reuse of disposable dialyzer equipment. FDA directs manufacturers to instruct buyers that equipment is for one time use only. However, FDA officials recognize that facilities are reusing equipment and at least some in FDA feel that reuse is not a real problem if the equipment is cleaned properly. FDA points out that in this matter, as is the case with other FDA approved products, FDA has no control over use of products beyond the manufacturer.

CDC There are a variety of studies underway at CDC which look at the potential health hazards of dialyzer reuse, including the kind of substances used to clean equipment. Particular concern has been registered about formaldahyde, apparently a frequently used agent.

NIH A number of studies are known to be underway here as well.

NCHSR/HCTA has not been heavily involved in the issue to date.

TRACER

HCFA At present, HCFA currently reimburses End Stage Renal Disease facilities as though equipment were being used on a one time basis, although it is known many facilities in fact are reusing equipment. Thus, it is thought that HCFA may be paying too much for services and could generate savings by permitting reuse if determined a safe procedure.

Staff Note re Lead on Issue It is not clear that PHS should take the lead on this issue, since financing issues are the principal focus of the current Heinz investigation. There is an existing process by which HCFA can seek scientific advice on coverage issues by making a formal request to NCHSR. The NCHSR then canvasses the appropriate PHS agencies and the larger scientific community on aspects of the question and will present HCFA with a recommendation. Unless the discussions on Wednesday alter our current understanding, it would probably be preferable for HCFA to pursue the matter through established mechanisms, rather than set up a special group.

Marcy Lynn Grace

DEPARTMENT OF HEALTH AND HUMAN SERVICES

National Center for Health Services Research
and Health Care Technology Assessment

MAR - 7 1986

NOTE TO DR. MACDONALD

CONFIDENTIAL

SUBJECT: Dialyzer Reuse

Prior to today's hearing with Senator Heinz on this subject, I had assumed that we could carry out the assessment within the 60-day period that was specified in your March 5 memorandum. However, the original plan was to have used this as a way of deferring a response to the Senator. Unfortunately, it was decided that I should promise in the testimony to carry out this assessment. This means the process will be carried out under the careful scrutiny of committee staff, probably Mr. Mitchie.

The substantive part of our analysis is completed. We had to do that for the testimony. There is nothing new that will be found. But, because of the sensitivity of this and the activation of constituency groups as a result of these hearings, I think it best that we be allowed 90 days for carrying out the study. That will allow time for following our formal process which includes a notice to the Federal Register and solicitation of comments from the cognizant specialty and sub-specialty groups. In this case we will probably solicit comments from the patient groups as well. They won't have facts to give us but will give us strident opinions. I don't exptect that Mr. Mitchie will perceive the study as anything but a whitewash and consequently that will be the Senators view. But I think we can forestall at least some criticism by going to 90 days.

If you concur I will send you a formal request for an extension without any of this background.

/s/ John E. Marshall

John E. Marshall, Ph.D.
Director

DEPARTMENT OF HEALTH & HUMAN SERVICES

Public Health Service

Memorandum

Date MAR 13 1986

From Director, National Center for Health Services Research and Health Care Technology Assessment

Subject Reuse of Dialysis Supplies

To Acting Assistant Secretary for Health

On March 5, you requested that NCHSR provide a review with respect to the safety, efficacy and cost effectiveness of dialyzer reuse within 60 days. Our initial review of the requirements for adequately completing this task indicate that I will require 90 days. Controversy over the potential adverse effects of disinfectants used in the processing of dialyzers for reuse suggests the need to place a notice in the Federal Register for the purpose of receiving comments from patients, the dialysis community, and the general public. Addressing this question will also require consultation outside of the Public Health Service. I regret the necessity of requesting a delay but believe that the conclusions we will reach after this process will be more sound than would be the case were I to take less time.

John E. Marshall, Ph.D.

cc: Dr. Carter

DEPARTMENT OF HEALTH AND HUMAN SERVICES

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MAR 5 1986

Acting Assistant Secretary for Health

Reuse of Dialysis Supplies

Director, National Center for Health Services Research
and Health Care Technology Assessment

Current practice for the use of dialysis supplies, especially the filter, varies among dialysis centers. While the FDA has approved the filter as both safe and efficacious for one use, its reuse has never been formally assessed in the PHS. Further, the cost implications of the variance are of interest to HCFA and the Congress, as well as the PHS. There is a need to assess the clinical and cost trade-offs between single and multiple use of dialysis filters.

The importance of this issue dictates a timely analysis. Please complete a review and provide me with your conclusions with respect to the safety, efficacy, and cost-effectiveness of dialyzer reuse within 60 days. If this timetable is not feasible, please provide me with an alternative schedule.

/s/ Donald Ian Macdonald, M.D.

Donald Ian Macdonald, M.D.

Prepared by: OHPE:JMPriedman:jcc/pr:245-6135:2/25/86:[illegible]

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OHPE	Grossman	2/25/8						

DEPARTMENT OF HEALTH & HUMAN SERVICES
DEPARTMENT OF HEALTH AND HUMAN SERVICES
Public Health Service

Memorandum

Date APR - 9 1966

From Director
Office of Health Technology Assessment

Subject Reuse of Hemodialyzers

To Acting Director
Office of Medical Applications of Research
National Institutes of Health

The Public Health Service (PHS) through the Office of Health Technology Assessment (OHTA), within the National Center for Health Services Research and Health Care Technology Assessment announces that it is performing an assessment of what is known of the risks and/or benefits associated with the use of reprocessed hemodialyzers, blood lines, transducer filters and dialyzer caps which are labeled by manufacturers for "single use only," and are reused in the treatment of patients undergoing chronic maintenance hemodialysis for end-stage renal disease.

Specifically, the assessment of the risks and/or benefits associated with reprocessing and reuse seeks to determine the following: (1) Is it safe and efficacious to reuse these devices under existing clinical and reprocessing practices?; (2) When reused under existing clinical and processing practices, is there potential for dialysis patients to suffer infections or other short and/or long term adverse effects, associated with formaldehyde or other chemicals used in the reprocessing of dialysis devices?; (3) What is the extent of reuse of dialysis devices, including the dialyzer, blood lines, transducer filter and dialyzer caps?; (4) What guidelines and/or recommendations, if any, exist for the reprocessing and reuse of "single use only" dialyzers, blood lines, transducer filters and dialyzer caps?; (5) To what extent are such guidelines followed and/or defined as accepted medical practice?; (6) Are there any ethical considerations associated with the reprocessing and reuse of these devices?; (7) How does the cost of single use of each of these devices compare with the cost of reprocessing each of these devices?

This assessment intends to incorporate the most current information concerning the safety and clinical effectiveness of the practices of reprocessing and reusing the subject dialysis devices. Any existing medical or industry guidelines regarding these practices will also be addressed. An assessment by your organization of the safety and clinical effectiveness of this technology would be most helpful to us in formulating the PHS report.

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The information being sought concerns past, current, and planned research related to the practices of reprocessing and reuse of the dialysis devices listed above. Well-designed clinical studies and information related to the clinical acceptability and effectiveness of these practices is also sought, along with recommendations on how to ensure safety and efficacy of these practices and to meet the needs of the dialysis patient, physician and clinic.

We intend to complete this assessment by June 15, 1986. To help us accomplish this, please provide your response by June 2, 1986. If you need additional information or clarification, please contact Mr. Martin Erlichman at (301) 443-4990.

Enrique D. Carter, M.D.

DEPARTMENT OF HEALTH & HUMAN SERVICES

Public Health Service

~~DEPARTMENT OF HEALTH AND HUMAN SERVICES~~

Memorandum

Date · APR - 9 1986

From Director
Office of Health Technology Assessment

Subject Reuse of Hemodialyzers

To Associate Commissioner for Health Affairs
Food and Drug Administration

The Public Health Service (PHS) through the Office of Health Technology Assessment (OHTA), within the National Center for Health Services Research and Health Care Technology Assessment announces that it is performing an assessment of what is known of the risks and/or benefits associated with the use of reprocessed hemodialyzers, blood lines, transducer filters and dialyzer caps which are labeled by manufacturers for "single use only," and are reused in the treatment of patients undergoing chronic maintenance hemodialysis for end-stage renal disease.

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Page 2 -

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Enrique D. Carter, M.D.

DEPARTMENT OF HEALTH & HUMAN SERVICES

Public Health Service

Office of the Assistant Secretary
for Health
Washington DC 20201

April 11, 1986

NOTE TO ANNA BOYD

Through: Bob Rickard

Attached is a draft response to the letter from Senator Heinz that asked Dr. Bowen to take action against dialyzer reuse. We have incorporated the changes you suggested, but have not yet cleared the letter with FDA Commissioner Young. We have asked FDA to notify us Monday of that clearance.

You should be aware that the FDA General Counsel believes that the letter, as written, may close the door on future attempts to regulate dialyzer reuse. That is, by saying that reuse is part of a physician's practice and is exempted from GMP regulations, it will be extremely difficult to change our minds later (if future problems dictate the need to reconsider regulation of the procedure). FDA staff believe that Dr. Young has agreed on that firm a statement, but have asked him to confirm it in his review of the response.

Also, we assume you will seek L's concurrence in the response.

Bill Hubbard
PHS Executive Secretariat

The Honorable John Heinz
Chairman
Special Committee on Aging
United States Senate
Washington, D.C. 20510

Dear Mr. Chairman:

This responds to your letter expressing your concerns over the administration and regulation of Medicare-funded hemodialysis in the End Stage Renal Disease (ESRD) program.

I share your feelings of doing all that is possible to protect the health and rights of ESRD patients. The depth of Dr. Marshall's testimony at your March 6 hearing expressed the strong commitment the Department has shown for the welfare of ESRD patients in implementing and improving this program since its inception in 1972.

In the discussion of ESRD it is important to distinguish between the terms, reuse and reprocessing. Reprocessing means subjecting a device to a special protocol in preparation for reuse. This protocol normally includes cleaning, disinfection or sterilization, and testing of the device. Reuse is the process of utilizing a medical device more than once on the same patient or on different patients.

Dialyzer reuse is a recognized medical practice which has a history of safety dating back to 1967. Despite a sharp rise in the practice of reuse during the 1980's, morbidity and mortality statistics have remained unchanged. In our view there is no convincing evidence to indicate any health hazard associated with reuse if the dialyzer is reprocessed properly. The few reports of adverse reactions involving hemodialysis patients have not been attributed to reprocessing. Instead, improper procedures, inconsistent with the practices of the majority of the centers, have been indentified as the cause of these incidents.

With the developments of revised standards for the reuse of hemodialyzer produced by the National Kidney Foundation and the new Association for the Advancement of Medical Instrumentation guidelines for the proper reprocessing, resterilization and reuse of dialyzers, adequate safeguards exist to assist those who practice reuse. These guidelines, which delineate safe procedures ranging from disinfection to patient monitoring to environmental concerns, will assure the safety of both patients and staff. Nonetheless, the Public Health Service is continuing to monitor the practice of dialysis to ensure its safety. To assure that all existing scientific information is thoroughly considered, the Acting Assistant Secretary for Health has directed the National Center for Health Services Research to complete another formal assessment with respect to safety, efficacy and cost-effectiveness of dialyzer reuse. This effort was announced in the April 10, 1986 Federal Register (advance copy enclosed).

You requested that I consider imposing Good Manufacturing Practice (GMP) regulations on dialysis clinics that reprocess and reuse disposable dialysis devices.

Our legal counsel reminds us that the Federal Food, Drug, and Cosmetic Act, sections 510(g)(2), 519(b)(1) and 704(a)(2), specifically exempts from device regulation "practitioner licensed by law to prescribe or administer drugs or devices and who manufacture, prepare, propagate, compound or process drugs or devices solely for use in the course of their professional practice." Dialyzer reuse in a clinical setting is a medical choice made by the presiding physician and therefore is exempted from FDA's GMP regulations.

I appreciate receiving your views on this important public health matter. Please be assured that the Department will continue its commitment to the health and safety of ESRD patients and to the continued improvement of this program according to our legal mandate and the latest scientific and medical knowledge.

Sincerely,

Otis R. Bowen
Secretary

Enclosure

Prepared by: MEck/FDA/443-3793/4-9-86
Revised by: WHubbard/PHS/4-11-86

DEPARTMENT OF HEALTH & HUMAN SERVICES Public Health Service

DEPARTMENT OF HEALTH AND HUMAN SERVICES

Memorandum

Date · APR 15 1986

From Director
Office of Health Technology Assessment

Subject Reuse of Hemodialyzers

To Assistant Director for Science
Centers for Disease Control

The Public Health Service (PHS) through the Office of Health Technology Assessment (OHTA), within the National Center for Health Services Research and Health Care Technology Assessment announces that it is performing an assessment of what is known of the risks and/or benefits associated with the use of reprocessed hemodialyzers, blood lines, transducer filters and dialyzer caps which are labeled by manufacturers for "single use only," and are reused in the treatment of patients undergoing chronic maintenance hemodialysis for end-stage renal disease.

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We intend to complete this assessment by June 15, 1986. To help us accomplish this, please provide your response by June 2, 1986. If you need additional information or clarification, please contact Mr. Martin Erlichman at (301) 443-4990.

Enrique D. Carter, M.D.

DEPARTMENT OF HEALTH & HUMAN SERVICES
Public Health Service

Memorandum

Date [illegible]

From Acting Assistant Secretary for Health

Subject Heinz letter on hemodialysis

To The Secretary
Through: US______
ES______

As you know, on March 21 Senator John Heinz wrote you about the reuse of dialysis devices, and asked that you require the Food and Drug Administration to impose its Good Manufacturing Practices (GMP) regulations on that practice, i.e., have FDA regulate the reuse of dialysis devices to assure that they are safe and effective. This memorandum is intended to present a draft reply to that letter, and to explain the issue involved.

Hemodialysis is one of three treatments for End Stage Renal Disease (ESRD). Medicare, through the ESRD program, pays about $2 billion per year to dialyze almost 80,000 Americans. As you know, dialysis involves running blood through the hollow fibers of an artificial kidney--a dialyzer. FDA has approved those dialyzers as safe and effective--for one time use. However, since each filter costs about $15, and because some patients have an adverse reaction to new filters, many dialysis centers reuse dialyzers after disinfecting them with formaldehyde. Dialyzer resuse has increased greatly in recent years; 60% of dialysis patients now use reprocessed dialyzers. (Note: reuse is the medical decision to reprocess a dialyzer; reprocessing is the technical procedure for cleaning the dialyzer.)

Senator Heinz suggests, among other things, that dialyzers are reprocessed so that dangerous formaldehyde residues and/or bacteria remain in reused filters. FDA replies that dialyzer reuse is part of medical practice, and that numerous studies have found dialyzer reuse to be a safe procedure. Therefore, FDA believes the response to the Senator should state that dialyzer reuse is exempt from FDA regulation. FDA's General Counsel has concluded that a legal argument can be made either way--for imposing GMPs or not. However, counsel also advises that, if your response concludes that FDA regulations cannot be imposed, we may close the door on that regulatory mechanism if future problems with dialysis are identified.

Attached is a lengthier background paper on hemodialysis and the PHS draft response to the Senator's letter--containing the language we recommend, that FDA not further regulate dialyzers.

/s/ Donald Ian Macdonald, M.D.

Donald Ian Macdonald, M.D.

Attachment

BRIEFING PAPER

Hemodialysis

ISSUE:

Senator Heinz wants FDA to enforce reprocessing standards on hemodialysis clinics by imposing Good Manufacturing Practice (GMP) regulations. The Senator's objective in enforcing the standards is to ensure that reprocessing is done safely and effectively.

RESPONSE:

The industry has guidelines for reprocessing and reuse that ensure safety and effectiveness.

There is no evidence of other than isolated problems with the reprocessing.

Therefore there is no need to enforce GMPs on the industry at this time.

Imposition of GMPs may raise issues of interfering with medical practice. FDA is prohibited from regulating "practitioners . . . in the course of their medical practice," in sections 510(g)(2), 519(b)(1) and 704(a)(2) of the Federal Food, Drug, and Cosmetic Act.

CONCERNS:

General Counsel says a legal argument can be made for imposing GMPs or not enforcing them on dialysis clinics. It therefore becomes a policy decision.

DEFINITIONS:

Hemodialysis is one of three treatment modalities for End Stage Renal Disease (ESRD). The others are peritoneal dialysis and transplantation.

Dialysis is the artificial performance of the kidney function by transferring waste products, fluids and electrolytes across a semi-permeable membrane separating the blood and an artificial fluid (the dialysate) using the mechanisms of osmosis and diffusion.

Hemodialysis involves running the blood through the hollow fibers of a dialyzer (artificial kidney). The dialyzer is composed of many hollow fibers surrounded by dialysate fluid. The hollow fiber walls are the semi-permeable membrane across which diffusion occurs.

REUSE: the medical decision to reprocess a dialyzer.
REPROCESSING: the technical procedures for cleaning the dialyzer.

HISTORY:

1960 - Hemodialysis pioneered by Dr. Belding Scribner for ESRD patients.

1967 - Scribner reports reprocessing as technically feasible.

1972 - Social Security Amendments extended medicare insurance to ESRD patients.

SELECTED FACTS:

There are 1,400 dialysis centers nationwide.

Standard ESRD patient is dialyzed 3 or 4 times per week.

Current ESRD patient population is 78,000, costing $2 billion in medicare annually.

Reuse trend in the United States: 1977, 16%; 1981, 27%; and 1983, 60% of the patient population.

Mortality among dialysis patients is steady at approximately 19%.

DIALYZER--ISSUES:

-- Reaction to new dialyzers--"first-use syndrome"
-- Cost of approximately $15 per dialyzer

REPROCESSED DIALYZERS--ISSUES:

-- Greatly reduced "first-use syndrome" reaction
-- Formaldehyde is used to disinfect them

- may be an environmental concern for workers
- associated with production of anti-N-antibodies
- long-term effects are not known

-- Reuse reduces dialysis costs

STUDIES:

1979 - NIH study - "Multiple Uses of Hemodialyzers"

1980 - FDA study - "Risks and Hazards Associated with hemodialyzers

1982 - "National Workshop on Reuse of Consumables in Hemodialyzers"-- National Center for Health Care Technology and FDA resulted in consensus guidelines for reprocessing of disposable dialysis equipment

1982 - Interdepartmental ESRD Strategic Workshop convened by HHS recommended clinical trials for reuse

1983 - PHS ESRD Coordinating Committee concluded clinical trials are not needed, instead develop a data base to monitor a wide range of ESRD related issues including reuse

1985 - NIH and HCFA agreement to develop a database to study biocompatibility, dialysates, dialyzer reuse, long-term survival, acute-phase reactants, post-dialysis syndrome and vascular access

1986 - Pollack, et. al., - 1,300 patients over 7 years showed no difference in morbidity, mortality or days of hospitalization between single and multiuse patients

INVESTIGATIONS:

1982 - CDC investigation of Louisiana center incident. Fourteen deaths attributed to contaminated water; CDC recommends increasing formaldehyde concentration to prevent recurrence.

1984 - CDC survey--very minor problems with infection due to water; reuse resulted in no differences in hepatitis B infection rate.

INTEROFFICE MEMORANDUM

Date: 17-Apr-1986 06:29
From: Kobren, Lawrence
LNK
Dept: CTA-OTD
Tel No: 301-443-2436

TO: See Below

Subject: More Pros & Cons

PLNO to Frank Morlock
RGBO to Frank Pipari

The following, for your consideration, could be added to the Policy Plans and Reuse Options that we are considering: (I think this basic question must be presented to the Senior Staff for their decision)

Should FDA consider those who process a medical device (whether or not it is labled for single use) for Reuse to be subject to the regulatory requirements of the Medical Device Amendments (note: we don't have to call them 'manufacturers')?

DISADVANTAGES:

1. This is an area which has not traditionally been regulated by FDA and the consequences of this action cannot be predicted.

2. The intent of congress in enacted the Medical Device Amendments was directed at the original manufacturers and not hospitals, clinical facilities, or physicians.

3. FDA does not have the resources to effectively carry out the requirements of law regarding inspections, GMP reviews, registrations etc. if these facilities were brought under our jurisdiction.

4. This could be construed as interference with the practice of medicine which we have not done in the past and which we said at the Senate hearings that we would not do.

5. It may be difficult to distinguish between those facilities who reprocess reusables (surgical instruments e.g.) and disposables and thus (our draft policy, as you know doesn't make this distinction) FDA may have to bring them under the regulation even if we don't want to.

ADVANTAGES

1. FDA can assure that proper reprocessing protocols for both disposables and reusables are being used.

2. Because of the cost of implementing protocols, some smaller facilities or facilities who believe they cannot do effective reprocessing may decide not to reprocess.

3. Under the existing law, physicians are exempt from most provisions of GMP and other aspect of registration and listing, and the Commissioner could exempt them from many other requirements. Facilities which process 'reprocessables' could also be exempted if the commissioner so chooses.[Anyone have any problem with this, let me know- I don't feel comfortable with this. I'm worried that hospitals that clean and sterilize their surgical instruments may have to be 'regulated' and I am looking for a way to exclude them]

4. MDRs would enable FDA to be immediately aware of problems associated with Reuse.

5. Distinction between the "commercial" reprocessor, the physician reprocessing in his/her own practice, and those physicians reprocessing "for profit" can be clearly made and how FDA will treat each. This is not easily done if none fall under the regulations.

6. HCFA can monitor hospital and dialysis facilities and report problems to FDA for action.

7. FDA will be able to get control of a potentially serious situation with respect to the Reuse of medical devices quickly and hopefully prevent or at least lower the risks to patients before people are injured.

Please go over these items. Change them, add to them, or toss them out if you want, but lets begin to put something together that we can use for the Option paper. Sent changes to me by EM or regular Mail.

Larry

Distribution:

TO:	Kobren, Lawrence	(LNK)
TO:	Gordon, Evelyn W.	(EWG)
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TO:	CDR - Planning	(PLNO)
TO:	OC - Regulatory Guidance	(RGBO)

DEPARTMENT OF HEALTH & HUMAN SERVICES

4/21/84
Office of the Secretary

Washington, D.C. 20201

MEMORANDUM TO THE SECRETARY

Through: US 4/24
COS
ES
DES 4/21

FROM: KB for Anna Boyd
Policy Coordinator/Health

SUBJECT: Heinz's Letter on Reuse of Dialysis Devices -- Background

Attached for your review is a response to Senator Heinz's recent letter on reuse of disposable dialysis devices. The main thrust of the Senator's letter is that FDA should impose a limit on reuse of dialysis devices under the Good Manufacturing Practice (GMP) Regulations. In addition, Heinz encloses a report from his staff that makes many other recommendations on the dialysis device reuse issue. The recommendations are at TAB A. Furthermore, Heinz held a hearing on this issue in March where John Marshall (National Center for Health Services Research), John Villforth (FDA), and Bart Fleming (HCFA) testified for the Department.

Reuse of disposable dialysis devices has been practiced since 1967. Reuse has become more prevalent in the last few years with 60% of all dialysis facilities reporting reuse in 1983. Extensive PHS studies and wide-spread medical experience with reuse have provided no evidence of risk to patient safety if proper reprocessing is done. One serious incident of patient infections occurred in 1982 leading to 14 deaths and was attributed to improper disinfectant procedures. Increased reuse has not been associated with any generalized increase in patient death or illness.

Currently, neither HCFA nor PHS have issued any standards for reuse. The Department's position is that the decision to reuse disposable devices is a medical judgment made by the physician. Voluntary guidelines for reuse and reprocessing have been established by the National Kidney Foundation and the Association for the Advancement of Medical Instrumentation. Although the Department's position has been that no regulatory action is required to limit reuse, the National Center or Health Services Research and Health Care Technology Assessment is undertaking a new review of scientific information and positions regarding reuse. PHS has announced this study in the April 10 Federal Register and is soliciting new scientific evidence during a 60-day comment period. PHS plans to complete its review by early June.

Since reuse has been studied extensively, PHS does not anticipate any major new findings from the current study. However, should new evidence appear, the Department could consider issuing standards for reuse under either Medicare or FDA statutes. Since most dialysis is funded by Medicare, HCFA has broad authority in this area. FDA strongly opposes applying GMP standards in this area and has taken the position that we should tell Senator Heinz in this letter that the GMP regulations do not apply, in order to "close the door" to further pressure from the Senator. One concern is that, if we apply GMP regulations in this area of medical practice, many other areas could also arguably be included. Nevertheless, after discussions with Terry Coleman, PHS has agreed to the more open-ended language in the current version of the letter. (TAB B)

One side issue in the staff report is a recommedation that the regulations on the ESRD composite rate be delayed pending the resolution of the reuse issue. As you know, savings associated with those regulations are part of the FY 1987 budget. They were signed by you and we expect OMB clearance very soon. An issue in the regulations related to reuse is that the new composite rates reflect weighting by number of treatments and thus, tend to reflect costs of larger facilities. Larger facilities also are the ones which tend to reuse dialysis devices, and therefore, any savings from reuse are reflected in the new rates. If we continue to allow reuse of dialysis devices, Heinz wants us to consider a two-tiered reimbursement system to reflect the difference in facilities that practice reuse and those that do not.

John Marshall, who is heading the current PHS study of this issue is available to brief you, now, or at the conclusion of the study if that would be useful. At the conclusion of the study, ES will work with PHS and HCFA to provide you with an options paper on next steps.

DEPARTMENT OF HEALTH & HUMAN SERVICES

Public Health Service

Memorandum

Date . APR 29 1986

From Director, Medicine Staff (HFY-40)
Office of Health Affairs (OHA)

Subject Re-use of Hemodialyzers

To Director, Office of Device Evaluation (ODE)
Center for Devices and Radiological Health (CDRH)
(HFZ-400)

The Office of Health Technology Assessment (OHTA) is initiating an assessment regarding the use of reprocessed hemodialyzers, blood lines, transducer filters and dialyzer caps which are labelled by manufacturers for "single use only," and are re-used in the treatment of patients undergoing chronic hemodialysis for end-stage renal disease. The assessment seeks to gather information which will allow an evaluation of the risks and benefits of such practices.

Specific questions which OHTA hopes to address include:

1) Is it safe and effective to re-use these devices under existing practices?
2) With re-use, is there the potential for dialysis patients to suffer side effects associated with chemicals used in reprocessing?
3) What is the extent of re-use of dialyzer devices?
4) What guidelines or recommendations exist for reprocessing and re-use of "single use only" devices?
5) To what extent are such guidelines followed, or defined as accepted medical practice?
6) Are there ethical considerations associated with reprocessing and re-use?
7) How does the cost of single use of such devices compare with the cost of reprocessing?

Please attempt to provide your response to OHA by June 1, 1986. If you feel that this gives you insufficient time, please call Dr. Tom Holohan at 443-5470.

Robert V. Veiga, M.D.

A COMPREHENSIVE REVIEW OF HEMODIALYSIS EQUIPMENT AND RELATED PERIPHERAL SUPPORT EQUIPMENT: EFFICACY, EFFICIENCY AND SAFETY

VOLUME I OF II

Prepared by THE DEPARTMENT OF CONSUMER & REGULATORY AFFAIRS
SERVICE FACILITY REGULATION ADMINISTRATION
HEALTH FACILITY DIVISION
MAY, 1986
GOVERNMENT OF THE DISTRICT OF COLUMBIA
MARION BARRY, JR., MAYOR
CAROL B. THOMPSON, DIRECTOR
DONALD G. MURRAY, ACTING DIRECTOR

Executive Summary

This is a report of the study undertaken by the District of Columbia Department of Consumer and Regulatory Affairs, Service Facility Regulation Administration (DCRA/SFRA) under a contract with the Food and Drug Administration (FDA). The overall objectives of the Study, entitled "A Comprehensive Review of Hemodialysis Equipment and Related Peripheral Support Equipment: Efficacy, Efficiency and Safety" were to identify potential and/or existing problems related to design, operation and maintenance of equipment and to make appropriate recommendations for preventive measures for safe operation of the equipment to the Center for Device and Radiological Health of the FDA.

The request for proposal from the FDA called for the collection and analysis of hemodialysis equipment information in support of these overall objectives. The DCRA/SFRA was motivated to propose participation in this study because, among end stage renal disease patients, the District of Columbia has the highest mortality rate of all of the states in the nation. The study conducted by DCRA included on-site inspections of equipment, interviewing of hemodialysis facility staff and former home hemodialysis patients, and reviewing manufacturers' product literature.

The findings are based on analysis of survey data collected from fifteen hospital-based and freestanding hemodialysis facilities currently operating in the District of Columbia. The Study generated not only new research data, but also served to highlight the potential problematic areas that deserve further investigative studies. Although much anecdotal evidence was collected in the Study, the data were not in sufficient detail to draw definitive conclusions.

Significant findings include the following:

1. Water Purification System and Water Quality

   - Sophistication and efficacy of water purification systems are diverse. Several systems installed in the facilities fall short of compliance with the Association for the Advancement of Medical Instrumentation (AAMI) water quality standards for dialysis.
   - Incidence of low pH dialysis water appears to be associated with the frequency of reported dialyzer clotting.

2. Dialysate Delivery Systems

   - In general, delivery system performance was reported to be adequate with the exception of what appear to be random malfunctions of various monitors/alarms integral to delivery systems. In most cases, these monitor/alarm malfunctions were attributed by staff to miscalibration or improper adjustment.
   - Potential problems with peripheral equipment such as air/foam detectors, which are in some cases integral with the dialysate delivery systems, are addressed in separate sections of the report.

3. Dialyzers

- Dialyzer clotting appears to be more prevalent in facilities where dialysis water has a low pH of less than 6.5.

- Some dialyzer types appear to be less amenable to reuse than others as the result of an inability to assess residual blood in reuse dialyzers due to discoloration and clotted fibers.

4. Blood Pumps

- There were few reported problems directly attributed to blood pumps with the exception of an incident involving staff injury when the staff member's fingers were caught in the pump rollers.

- Other problems implicitly or superficially associated with blood pumps were more appropriately attributed to loose tubing connections, ill-fitting tubings or other externalities.

5. Infusion Pumps

- Heparin infusion pumps are used in eight of the fifteen facilities. The remaining several freestanding facilities, which have reuse programs, administer bolus doses of heparin prior to dialysis treatment.

- Only rare incidents were reported on inadequate delivery of heparin or air bubbles entering the blood circuit which were attributed, by staff, to the syringe being too tight or too loose, respectively.

6. Air/Foam Detector

- Some incidents of detector or alarm failures were reported when foam was observed to have passed undetected.

- Over-sensitivity or false alarms were reported from a majority of facilities. Frequency of false alarms and foam formation increases under single needle dialysis.

7. Blood Tubing Sets

- Occurrences of blood tubing set failures (leaking, malocclusion of unions, fittings and splitting) were higher in facilities which practice reprocessing and reuse of arterial blood tubing sets.

8. Blood Access

- Clotting and infection of blood accesses constitute a significant portion of incidents which require patient treatment. Clotting appears to be more prevalent in patients with Gortex grafts.

9. Fistual Needles

- There were no significant problems reported with performance and use of fistula needles. However, there were single instances of facilities receiving batches of needles with dull tips, excessive silicon and bent needle tips.

10. Single Needle Devices

- Single needle dialysis is practiced in six of the fifteen facilities. Five of these facilities reported increased occurrence of foam in arterial lines or air/foam detector sensitivity during single needle dialysis.
- Clamps provided with tubing sets for single needle dialysis appear to be insufficient to provide complete occlusion at needle/blood tubing joints. Several facilities substitute metal clamps to remedy this problem.

11. Equipment Maintenance

- In general, maintenance schedules, routines and procedures are diverse across the facilities.
- In particular, the maintenance schedules for the air/foam detector appear to be inadequate. Only one facility checks the air/foam detector prior to each hemodialysis treatment. Four facilities check air/foam detector performance daily. The remaining facilities perform air/foam detector maintenance at intervals ranging from weekly to every six months.
- Only one facility reports changing the transducer protector with each patient use. All others change the protector only after there are visible signs of contamination.

12. Manufacturers' Literature

- In spite of improvement over the years in the quality and extent of coverage of manufacturers' literature, inadequacies remain in the form of omissions. Lacking is information on materials used, specifications, chemical incompatibilities, methods of sterilization, warnings and precautions.

13. Home Hemodialysis Programs

- The knowledge of home patients in performing hemodialysis procedures and on the operation of the equipment appears to be accurate and sufficient.
- The use of water treatment equipment for home patients appears to be correlated with the education preparation of the dialysis training instructors and the organizational structure of the training facilities.
- Maintenance of equipment is the major problem encountered by home patients.

14. Hemodialysis Facilities Staff

- Classroom hours for orientation and training programs are extremely diverse across the facilities. Analyses of data collected did not provide a definitive cause-and-effect relationship between the training of staff and the frequency of incidents in the facilities.

In light of the findings and in keeping with the study objectives, the Department of Consumer and Regulatory Affairs recommends that further studies be conducted in: blood tubing reuse practice; compliance of facilities regarding equipment preventive maintenance procedures as recommended by manufacturers; adequacy of home hemodialysis training programs; and the quality and adequacy of orientation/training programs for staff in hemodialysis facilities.

IV. Summary of Findings

The findings summarized in this section are the result of the data analyses documented in this report. The major findings include:

1. Reporting of equipment related incidents in the survey data is nonspecific or incomplete. This is manifested in survey responses of "several," "frequent," "occassional," etc., when incident frequency counts were requested on the survey forms. This is probably indicative of lax facility reporting requirements for incidents when patient treatment is not required.
2. Clotted access and infected access account for 88.6 percent of reported incidents requiring patient treatment.
3. All reported cases of sepsis/bacteremia (8.4 percent of reported morbidity incidents) were observed in freestanding facilities; none were reported from hospitals.
4. Sepsis/bacteremia is more prevalent, in terms of incidents per 1000 treatments, among facilities with blood tubing set and/or dialyzer reuse programs.
5. The only reported cases (two) of hard water syndrome are associated with a facility which uses tap water for dialysis since this facility has no water purification system for pre-treatment of dialysis water.
6. Water quality and conformance with AAMI standards is correlated with the sophistication of water purification systems.
7. Excessive levels of fluoride and nitrate contaminants in dialysis water indicate a need for inclusion of deionizers in water treatment systems.
8. Water purification system configurations which lack reverse osmosis systems are responsible for the highest levels of contaminants in dialysis water.
9. Dialyzer clotting appears to be correlated with low pH of dialysis water. This is evident in observations of high rates of clotted dialyzer incidents at facilities which indicate low pH water in water quality analysis reports.
10. In connection with the potential hazards of low pH dialysis water, failure of certain procedures to prolong equipment life may be in conflict of interest with sound patient care. For example, three facilities acidify water to prolong the life of the reverse osmosis membrane. Malfunctioning or improperly calibrated acidifiers may be responsible for low pH dialysis water.

11. Blood tubing sets appear to be more reliable if manufactured subject to criteria for compatibility with the applicable dialysate delivery system. In general, tubing sets were reliable if manufactured by the same producer/vendor which manufactured the dialysate delivery system.

12. Blood tubing set failures (leaking, malocclusion of unions and fittings, splitting) are higher in facilities which practice reprocessing and reuse of arterial blood tubing sets.

13. Transducer protectors are considered, by manufacturers, to be a single use disposable item. Only one facility reports the practice of changing the transducer protector with each patient use. All other facilities use transducer protectors for multiple treatments, with varying change criteria.

14. The preventive maintenance schedule for air/foam detectors appears to be inadequate for 14 of the 15 facilities. The proper functioning of the air/foam detector should be carefully examined before each hemodialysis treatment to inhibit potential complications.

15. The preventive maintenance schedule for water softeners indicates that four facilities employ rock salt in the regeneration process. The use of rock salt in place of pellet salt can cause deterioration of the brine valve.

16. Product information disclosed by manufacturers is inadequate. The most common product information omitted is material and generic nature of material used, specifications, chemical incompatibilities, sterilization methods, environmental requirements, warnings and precautions.

17. The use of water treatment equipment for home hemodialysis patients appears to be correlated with the education preparation of the dialysis training instructors and the organizational structure of the training facilities.

18. Maintenance of equipment is the major problem encountered by home hemodialysis patients.

V. Research Approach

A survey of all hemodialysis facilities in the District of Columbia was performed by the Health Facility Division (HFD) to collect data on equipment, practices and procedures. In brief, the survey information may be broken down into general areas of (1) facility characterizations (organization, administration, training, equipment types, etc.), (2) equipment characterizations by type and age and by subsystem (water purification, dialysate delivery, blood access, blood tubing, dialyzers, blood pump, infusion pumps and air/foam detector), (3) character-izations of practices and procedures for equipment maintenance and reuse of disposables, (4) manufacturers' product literature, and (5) home hemodialysis patients.

Included within the survey are data on incidents that occurred during the six-month period from October 1984 through April 1985. These data are summarized categorically in the facility data section of the survey instrument, and potentially related observations of equipment or procedure failure and morbidity for the same time period are included throughout the other sections of the survey instrument. In general, the incident data for the six-month period from October 1984 through April 1985 will be referred to as "Log Data" and the other survey information will be referred to as "Characteristic Data." Each of these two classes of data has been analyzed for different purposes using different methods.

This section of the report describes briefly the types of analyses employed to the survey data in general and to the "Log Data" and "Characteristic Data" as distinct subsets of the survey data. The analyses have been oriented toward ultimate identification of factors which may induce or be related to problems in the use of hemodialysis equipment. The data are insufficient to draw conclusive cause-and-effect relationships; however, the hypothesis is that there may be sufficient evidence to warrant further examination of certain factors associated with hemodialysis facilities, equipment, and practices.

The methods employed consist of general statistical analysis and data summaries intended to characterize the facilities, equipment, and practices as well as analyses such as cross tabs and correlation/regression intended to highlight possible relationships between equipment incidents (as a dependent variable) and potential causes of these incidents (as independent variables) and between morbidity (as a dependent variable) and equipment incidents (as an independent variable). Product literature from manufacturers is summarized and analyzed for compliance with the American National Standards established by the Association for the Advancement of Medical Instrumentation (AAMI) for hemodialysis systems, first-use hemodialyzers, and blood tubings.

The survey data have been arrayed in tabular form to display the results obtained for all facilities surveyed by data category. Principle tabular data arrays include: Organization and Administration; Education, Experience, and Training; Equipment Type, Age and Condition; Dialysate Delivery Incidents; Blood Access Incidents; Blood Tubing Incidents; Dialyzer Incidents; Blood Pump Incidents; Air/Foam Detector Incidents; and Morbidity Incidents. Additional arrays and tables were developed to display other derived statistics used in the analysis.

Summary statistics in the form of frequency counts, mean, median, standard deviation, etc. were developed where applicable and appropriate. In addition, performance measures were developed as statistics for comparative analysis across facilities. The primary performance measure consists of incident rates expressed as ratios of the number of incidents to the estimated number of treatments for the six-month period surveyed.

These basic statistical analyses characterize the facilities in general and permit categorization of facilities with respect to the frequency of incidents, equipment types, practices or other factors captured by the survey instrument.

For the Characteristic Data, the methods employed were directed toward isolation of factors common to incidents or to characterize those facilities with high rates of incidence vis-a-vis facilities with relatively lower rates. The objective was to paint characteristic portraits of varying qualities of hemodialysis service.

The Log Data were originally considered to be amenable to correlation and regression analysis where the objective was to study the correlations between morbidity (dependent) and equipment incident (independent) data. Other independent variables from the Characteristic Data were admitted to the correlation analysis. Foremost among the candidates for inclusion in the correlation analysis were quantified data on staff education and experience, reuse procedures and equipment characteristics.

In general, the methods actually employed were in fact consistent with the methods proposed; however, in view of the quality and number of observations of the Log Data obtained, especially for equipment-related incidents, the ability to perform correlation analyses was severely limited and, as a result, current correlation studies are considered to be inconclusive. This has been attributed to the assumption that facility level documentation and reporting of equipment incident data and other independent variables were not accurate enough to provide data of sufficient quality to support the correlation analysis.

The morbidity data, on the other hand, are assumed to be sufficiently accurate to support the findings in this report. This assumption is based on the fact that facility reporting requirements for morbidity incidents are more stringent than reporting requirements (if any) for equipment failure or malfunction. For example, when morbidity data were requested, the response was expressed as the number observed during the six-month period surveyed; however, when equipment-related incident data were requested, the response, in many cases, was "Several" or "Frequent" instead of an actual frequency count.

In summary, the methods employed are appropriate for the data obtained, and the preliminary findings can be supported by the existing data base.

Finally, the study effort benefitted from the advice and review of the Study Review Panelists (Appendix E), a group of professionals selected for their association with public health policy, nephrology, and hemodialysis practice and procedure.

a particular system type or manufacturer. Figure IX-9 provides a summary of incidents by facility and equipment type.

In addition, two facilities reported observations of foam/air or microbubbles which passed the air/foam detection device undetected. It is not known from the data whether these malfunctions of the detector allowed air to pass in sufficient quantities to induce patient symptoms.

Finally, three facilities reported observations of saline or saline/blood mixtures passing undetected, together with comments that the air/foam detectors in use are not designed to alarm when saline is passed.

8. Blood Tubing Sets

At least 48 incidents of blood tubing set failure were reported. The frequency of those incidents is summarized in tabular form by facility in Figure IX-10. Forty-five of these incidents could be identified to tubing set/dialysate delivery system combinations as portrayed in Figure IX-11.

Eleven combinations of dialysate delivery system and tubing sets are in use in the District of Columbia. One specific tubing manufacturer accounts for 89 percent of the tubing incidents which occurred during the survey period. Referring to Figure IX-11, out of a total of approximately 45 tubing incidents reported, 40 incidents occurred on three types of dialysate delivery systems which were fitted with blood tubing sets from a single manufacturer. This could possibly be caused by compatability problems of these tubing sets with these delivery systems or by other factors such as blood tubing set reuse.

In this case, it is important to note that the high failure rate tubing sets are used in the six freestanding hemodialysis facilities which have blood tubing reprocessing and reuse programs. Since use of these types of tubings is coincident with blood tubing set reuse practices in the District of Columbia, it is impossible to draw conclusions on the general quality of these tubing sets without additional data on their performance in a non-reuse environment. The current hypothesis is that tubing set failure rates are higher in reuse situations.

In terms of the estimated number of treatments for the six-month period studied, the failure rate for reuse tubing sets is 1.20 per 1000 treatments, compared to a failure rate of 0.19 per 1000 treatments for all other types of tubing sets when reuse is not practiced.

Six of the 15 facilities have programs for reprocessing and reuse of blood tubing sets. Characteristics of the reprocessing programs are provided in Figure IX-12. Procedures for reprocessing include disinfection with formaldehyde in concentrations ranging from 2 percent to 2.8 percent. Concentrations of 2.6 percent and 2.8 percent are predominant. All facilities subject the reuse tubings to a pressure test and all but one facility reported regular procedures for bacteria colony counts.

Three facilities regularly use bleach in the reprocessing sequence; the other three facilities use bleach only on an exception basis if lipid is present in the lines or if discoloration is evident. All facilities pressure test the tubing sets and use the results of the pressure test as the primary criteria for discarding the tubing sets. In addition, one facility has established a ceiling of ten on the number of times tubing sets may be reused. Tubing sets at this facility are replaced after the tenth reuse regardless of pressure test results.

In other facilities, the average number of times that blood tubing sets are reused varies from 5 to 25. Equipment technicians or reuse technicians are charged with the responsibility of reprocessing. Patient care staff members, in general, approved the reuse programs, recommended no changes in procedures and believed these programs to be safe as well as economical.

The survey instrument on reuse programs also collected information on reprocessing of the pressure monitor transducer protector. (Facilities not practicing reuse of blood lines or dialyzers were not surveyed on transducer protector practices; however, the findings are equally applicable to all hemodialysis facilities.)

None of the facilities reprocess transducer protectors; however, the practices employed, in general, are not in compliance with manufacturers recommendations. The transducer protector is a disposable item which should be changed with each hemodialysis treatment. Only one facility complies with this recommendation. All other facilities subject the protector to multiple use, changing it only when there are signs of contamination.

There are risks and hazards associated with the multiple use of transducer protectors when multiple use occurs with single patient reuse and with multiple patient reuse.

The purpose of the transducer is to provide a mechanism by which the pressure within the arterial or venous chamber can be measured and changed into a readable, useable configuration. Therefore, by its nature, the transducer poses a high potential for contamination. As the pressure rises in the chambers which is made of a rigid non-compliant material, the solution (blood or saline) is forced into the next vacant space -- the pathway to the transducer. The solution could then contact the transducer protector. The transducer protector isolates the transducer from damage that results from a liquid solution coming in contact with its functioning components. Once the pressure in the chamber decreases, the solution in contact with or near the protector descends to its original position leaving the protector contaminated. Reuse of this contaminated protector without adequate sterilization could result in a potentially hazardous situation, especially when used on a different patient. It also follows that reuse for the same patient could also pose a risk as, by its structure, adequate flushing and rinsing is highly unlikely with a potential source of bacterial growth resulting. Transducer protectors should not be reused.

9. Blood Access

The six hospitals were surveyed for information on temporary blood accesses. All 15 facilities, both hospitals and freestanding, were surveyed for information on permanent blood accesses. The temporary access data and the permanent access data are summarized in Figures IX-13 and IX-14, respectively.

Among temporary accesses in use in the hospital facilities the subclavian cannula access was common to all six facilities. Three facilities had patients with femoral accesses; one had patients with catheter accesses and one had patients with dialyzing Hickman catheter accesses. The data available is too sparse to draw conclusions on relative performance characteristics of the various access types. Problems of poor blood flow, clotting or infection were reported from among five of the facilities. One facility provides access care daily and the remaining facilities provide access care three times per week prior to hemodialysis treatment. Antiseptics in use include acetone, betadine and iodine.

Permanent access types include shunts, fistulas and grafts. Shunts, in general, are considered to be temporary accesses placed for a period of two to three weeks until a newly placed fistula or graft access matures. The new "button" device, which has gained acceptance in other states, was not in use by any of the participating facilities.

In general access care is performed three times weekly. Only one facility provides daily access care. Antiseptics in use include acetone, betadine, alcohol, provadine, hydrogen peroxide, and phisohex. Several antiseptics

FIGURE VIII-1

SUMMARY OF EQUIPMENT RELATED AND OTHER PATIENT INCIDENTS

	Total of Reported Incidents	Number of Facilities Reporting Incidents
Water Purification Systems		
Reverse Osmosis System Leaks	5*	3
Premature R/O Membrane Failure	2	2
Reverse Osmosis Pump Failure	1	1
Bacterial Infestation	2	1
Dialysate Delivery Systems		
Pressure Irregularities (post-blood pump)	5*	5
Pressure Monitor Malfunction	9	3
Dialyzers		
Clotted Dialyzers	100*	11
Dialyzer Leaks	35	11
Use of Wrong Dialyzer	7	4
Air/Foam Detector		
Air/Foam Presence Observed	8*	8
Air/Foam Detector Malfunction	8*	6
Blood Access		
Collapsed Access	18*	5
Blood Tubing Sets		
Collapse	15*	6
Separation	19*	6
Union Leaks	8*	6
Fracture	6	2
Post-Pump Obstruction	15*	4
Use of Wrong Tubing	2	1
Other Patient Incidents		
Weight Loss	2	1
Weight Gain	2	1
Allergic Reaction	2	1

* Indicates at least one report of "several" or "frequent" which was counted as one for purpose of this tabulation. Therefore, frequency count entries marked * are lower bounds of actual frequency counts.

FIGURE IX-10
BLOOD TUBING SET INCIDENTS

Facility Code	Blood Line Collapse	Blood Line Separation	Blood Line Union Leaks	Blood Line Fracture	TOTAL Blood Line Failures
HDP	S	S	S	-	3
HD3	-	-	1	5	6
HD15	10	5	3	1	19
HD11	1	-	-	-	1
HD14	-	-	-	-	-
HD7	-	-	S	-	1
HD2	S	-	-	-	1
HM	-	-	-	-	-
HD8	-	2	-	-	2
HA0	-	6	1	-	7
HA5	-	4	-	-	4
HD1	-	1	F	-	2
HD9	S	-	-	-	1
HD6	S	-	-	-	1
HD12	-	-	-	-	-
TOTAL	15	19	8	6	48
Hospital	4	1	1	0	6
Free Standing	11	18	7	6	42
Non-Reuse	5	1	1	0	7
Reuse	10	18	7	6	41

S = Several
F = Frequent

FIGURE IX-11

BLOOD TUBING SET INCIDENTS
TUBING SET TYPE IN COMBINATION WITH DIALYSIS DELIVERY SYSTEM TYPE

Tube/Machine	Biosystem	Cobe	Drake Willock	Gambro	Hospal	Redy	Travenol	Total
Cobe	-	0	-	-	-	-	-	0
Cordis Dow	-	1	-	*[1]	-	0	-	1
Drake Willock	-	-	0	-	-	-	-	0
Erika	26	4	10	-	-	-	-	40
Extracorporeal	-	-	-	-	-	-	2	2
Gambro	-	-	-	2	-	-	-	2
Hospal	-	-	-	-	0	-	-	0
TOTAL	26	5	10	2	0	0	2	45

In the above matrix, eleven combinations of tubing sets and dialysis machines are represented. Tubing set and dialysis machine combinations which are not present in the facilities surveyed are designated by a dash (-).

[1] Several incidents of problems with Cordis Dow lines manufactured for Gambro machine; product was recalled by manufacturer and FDA was notified.

In general, tubing sets made by the same company that manufactured the dialysis machine functioned adequately. Eight-nine percent of all tubing set incidents involved Erika tubing sets in a reuse environment. The Erika tubing sets are all used by free-standing facilities which have tubing reuse programs. These tubing sets are manufactured by Erika for use on Biosystem, Cobe, and Drake Willock machines.

F UChran

DEPARTMENT OF HEALTH & HUMAN SERVICES Public Health Service

Memorandum

Date MAY 2 1986

From Director, Division of Gastroenterology/Urology and General Use Devices, DGGD (HFZ-420)

Subject Justification for the Purchase Order

To Assistant Director for Management, ODE (HFZ-405)

The antimicrobial agents for medical devices are regulated under the authority of the Federal Food, Drug, and Cosmetic Act by the Food and Drug Administration (FDA) as well as by the Environmental Protection Agency (EPA). A new disinfectant to be labeled for use in disinfecting medical devices is reviewed in a 510(k) premarket notification. The premarket testing requirements of antimicrobial agents for medical devices are documented in the draft Guidelines for the Premarket Testing of Disinfectants for Medical Devices developed by the Division of Gastroenterology/Urology and General Use Devices (DGGD) and now under review by the Center for Disease Control (CDC) and EPA.

One of the testing requirements involves the evaluation of the effect of the disinfectant on the material, structure, and performance of the device. A recent 510(k) submission of Amukin-D, which is a disinfectant with chlorine compound, shows some degradation of the material in hemodialyzers containg cuprophan or cellulose acetate membrane. Because of this finding, FDA required the manufacturer to contraindicate the use of Amukin-D on cuprophan and cellulose membranes based on in vitro testing of the disinfectant with these membranes. However, we have several serious concerns arising from the fact the Amukin-D caused degradation of cuprophan and cellulose membranes.

The above mentioned test was performed by Regional Kidney Disease Program (RKDP), Minneapolis Medical Research Foundation, (funded by the manufacturer) as were several other tests we have reviewed in several previous 510(k)s for disinfectants for reprocessing of hemodialyzers. Within the last 12 months, we also reviewed two other chlorine disinfectants and found them to be substantially equivalent partly based on the data submitted by the manufacturer from tests performed by RKDP. However, Amukin-D, unlike the other two chlorine disinfectants, was tested with slightly modified testing protocol. After consulting with DGGD, RKDP modified the testing protocol in order to better simulate the use conditions. Since the other chlorine disinfectants passed the previous RKDP protocol, DGGD needs to determine whether the major factor in causing the membrane degradation is the change in testing protocol or the disinfectant itself. The tests should be conducted as soon as possible to compare the results of the RKDP original versus the modified testing protocols. If the more stringent protocol prove to be the major cause, then DGGD will have to request new testing of the already marketed disinfectant.

The following is the information on regional Kidney Disease Program:

Regional Kidney Disease Program
Minneapolis Medical research foundation
701 Park Avenue
Minneapolis, MN 55415

Principal Investigator: Prakash Keshaviah, Ph.D.

The original protocol to be used is as follow:

1) Test will be conducted as on three cellulose acetate or cuprophan membrane.

2) Standard transport chracteristics and particulate matter will be determined (as appropriate) before and after the membrane exposure to the Amukin-D disinfectant.

3) Dialyzers will be appropriately prepared and filled with Amukin-D disinfectant at the recommended strength level for seven days.

4) A summary report will be submitted to DGGD no later than 45 days after the issuance of the purchase order.

5) The protocol should be the same followed by RKDP for previous disinfectants.

The cost of the test should not exceed $350.00.

Fernando Villarroel, Ph.D.

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PUBLIC HEALTH SERVICE-CDC-Atlanta
EPI-86-44-1 May 8, 1986

TO : Director, Centers for Disease Control

FROM : Hospital Infections Program
Center for Infectious Diseases

SUBJECT: *Pseudomonas* spp. bacteremia in hemodialysis patients—California

On May 6, 1986, Lee A. Bland, Jr., M.P.H., Sanitarian Director, Nosocomial Infections Laboratory Branch (NILB), Hospital Infections Program (HIP), Center for Infectious Diseases (CID), received a telephone call from the administrator of a community-based dialysis center in Los Angeles, California, regarding four patients with *Pseudomonas* spp. bacteremia who had had onset of symptoms while receiving dialysis at the center during April and May 1986. An investigation of the cluster of bacteremias had been initiated by dialysis center personnel and local health officials.

Further conversations were held between Mr. Bland, Steven L. Solomon, M.D., Assistant Chief, Epidemiology Branch (EB), HIP, CID; John J. Murphy, M.D., EIS Officer, EB, HIP, CID; Martin S. Favero, Ph.D., Chief, NILB, HIP, CID; Walter W. Bond, M.S., Microbiologist, NILB, HIP, CID; James M. Hughes, M.D., Director, HIP, CID; Stephen H. Waterman, M.D., M.P.H., Deputy Chief, Acute Communicable Disease Control, County of Los Angeles Department of Health Services; S. Benson Werner, M.D., Medical Epidemiologist, Infectious Disease Branch, California Department of Health Services; Irving Weitzman, Director, Emergency and Epidemiological Operations Branch, Food and Drug Administration, and officials at the dialysis center. It was agreed that Dr. Murphy would depart for Los Angeles on May 9, 1986, to meet with local public health officials and officials of the dialysis center and participate in the ongoing investigation.

Mr. Edward Coleman, Regional Consultant for Disease Control, Division of Preventive Health Services, HHS Region IX, was notified on May 8, 1986.

Steven L Solomon

Steven L. Solomon, M.D.
Assistant Chief
Epidemiology Branch
Hospital Infections Program
Center for Infectious Diseases

Martin S. Favero, Ph.D.
Chief, Nosocomial
Infections Laboratory Branch
Hospital Infections Program
Center for Infectious Diseases

James M Hughes

James M. Hughes, M.D.
Director
Hospital Infections Program
Center for Infectious Diseases

DEPARTMENT OF HEALTH & HUMAN SERVICES

Public Health Service

Memorandum

Date MAY 13 1986 Date sent to Dr Mohan to sign

From Director, Office of Device Evaluation, ODE (HFZ-400)

Subject Reuse of Hemodialyzers

To Director, Medicine Staff, Office of Health Affairs, OHA (HFY-40)

This is in response to your memorandum of April 29 concerning the Office of Health Technology Assessment (OHTA) assessment on the use of reprocessed hemodialyzers, blood lines, transducer filters and dialyzer caps.

All information concerning this matter in CDRH files is already available to OHTA as part of the Senator Heinz hearing package. ODE has no additional information on this matter. Dr. Villarroel has already discussed this issue with Dr. Holohan. If you have any questions, he may be contacted at 427-7750.

Kshitij Mohan, Ph.D.

DEPARTMENT OF HEALTH & HUMAN SERVICES
Public Health Service

Memorandum

Date MAY 28 1986

From Director, Medicine Staff (HFY-40)
Office of Health Affairs

Subject Reuse of Hemodialyzer Devices

To Director
Office of Health Technology Assessment
(OHTA)

This is in response to your request of April 9, 1986. All information concerning the issue of reuse of hemodialyzers, blood lines, transducer filters and dialyzer caps is already available to OHTA as part of the package prepared for the Senator Heinz hearing. The Office of Device Evaluation has no additional information. Individuals within the Center for Devices and Radiological Health who have had previous contact with OHTA regarding this issue, and who will continue to be available for consultation are:

Mr. Lawrence Kobren, HFZ-240, 443-2436
Dr. Fernando Villarroel, HFZ-420, 427-7750
Mr. Robert Eccleston, HFZ-1, 443-4690.

Robert Veiga MD
Robert V. Veiga, M.D.

4434C

June 2, 1986

Geraldine Flynn, R.N.
Unit Administrator
Community Dialysis Services of Inglewood, Inc.
501 East Hardy Avenue--Suite 100
Inglewood, California 90307

Dear Ms. Flynn:

Thank you for your invitation to participate in the investigation of [illegible] cases of bacteremia which occurred recently at Community Dialysis Services of Inglewood, CA. This letter is a summary of the preliminary results from that investigation.

Introduction

Between April 10 and May 2, 1986, four patients receiving maintenance hemodialysis treatments at Community Dialysis Services of Inglewood (CDSI) [illegible] ~~suffered episodes of~~ fever and/or chills during [illegible] dialysis [illegible]. In each instance, blood cultures obtained from the patients during or following dialysis grew gram-negative bacteria.

An investigation into possible causes of these intradialytic bacteremias was initiated by members of the staff at CDSI. Subsequently, assistance was requested and received from the Los Angeles County Health Department, (~~and representatives of~~; Cobe Laboratories, Inc., Lakewood, Colorado, and Alcide Corporation, Norwalk, Connecticut. On May ~~6~~ 7, 1986, the U.S. Centers for Disease Control (CDC) was invited to participate in the investigation, and [illegible] ~~I~~ ~~arrived in Los Angeles~~ on the evening of May ~~8~~ 9, 1986.

Descriptive Epidemiology

Initially, we reviewed the charts of the four patients with bacteremia. The[illegible] four patients had acquired bacteremia on four separate days; each had presented to CDSI for routine [illegible] dialysis without significant complaints or signs of ongoing infection. During the dialysis ~~visit~~ [illegible], each of the patients developed chills, and three of the four developed fever to >101°F. Three of the patients also experienced nausea and/or vomiting, and one complained of headache. The interval between initiation of dialysis and onset of chills ranged from 47 to 195 minutes (mean = 99). Blood cultures were obtained from three patients before discharge from the dialysis center; the fourth patient had blood cultures obtained at CDSI the following day. The four patients had been dialyzed on different dialysis machines and by different dialysis technicians. Three of the four episodes of bacteremia occurred among patients who were being dialyzed with cellulose acetate dialysis membranes (CD 4000, C.D. Medical [illegible]), and one case occurred in a patient being dialyzed with a cuprammonium rayon dialyzer (CF 1511, Travenol [illegible]). Only 10 of the 113 patients (9 percent) at CDSI are dialyzed using cellulose acetate dialyzers. Thus, patients on cellulose acetate dialyzers had a significantly higher risk of being diagnosed with bacteremia during this period (3/10 vs 1/103, $p = 0.002$, FET).

Each of the four dialyzers had been reused multiple times on the same patient, having been reprocessed before each use with a recently introduced commercial germicide (RenNew-D, Alcide Corporation*, Norwalk, Conn). All four patients had been dialyzed using an acetate-based dialysate. All four of the patients were subsequently hospitalized and treated with parenteral antibiotics, and eventually recovered without known sequelae.

In order to determine whether other cases of intradialytic bacteremia had occurred, as well as to determine rates of intradialytic pyrogen reactions, we reviewed the hemodialysis records of all 113 patients currently receiving hemodialysis treatments at CDSI for the period from January 1, 1986, to May 6, 1986. We defined a febrile or toxic intradialytic event (FTIE) as any dialysis during which a patient experienced chills or a temperature rise of 10 $>1.0^{\circ}$F to a temperature of $>100.0^{\circ}$F. We used this ~~sensitive~~ definition in an attempt to ascertain all dialyses during which bacteremia or a pyrogen reaction may have occurred. For each dialysis in which these criteria were met, we noted whether blood cultures had been obtained, results of those blood cultures, and any pertinent details recorded about the dialysis. A case of intradialytic bacteremia was considered to have occurred if the following three criteria were satisfied:

1. The patient presented to CDSI with no signs or symptoms suggestive of ongoing infection,

2. The patient experienced an FTIE during the dialysis, and

3. Blood cultures obtained from the patient during or after dialysis grew bacteria.

Based upon the results of this chart review, we calculated rates of FTIE's and intradialytic bacteremias per 100 hemodialyses for each week during the period from January 1, 1986, to May 6, 1986. Review of 4859 dialyses performed during this period showed no evidence of an increase in the rate of febrile/toxic intradialysis events. Only four cases of intradialytic bacteremia were diagnosed during this period, however, and these all [illegible] occurred during April and May (Figure 1). Thus, we believe that the problem consisted of a cluster of intradialytic bacteremias without any concominant increase in the rate of pyrogenic reactions. We therefore were looking for a pathogenic mechanism whereby gram-negative bacteria would be introduced into patients' blood during dialysis. The fact that no concominant increase in the rate of pyrogenic reactions was noted suggested that ~~heavy~~ [illegible] bacterial growth in the dialysate [illegible] fluid was not the ~~sole basis~~ [illegible] of the problem.

Procedure Review

We reviewed procedures in use at the hemodialysis unit in detail.

Critical procedures and intravascular devices which might be expected to lead to contamination of a patient's bloodstream during dialysis were identified. In particular, we concentrated on procedures for setting up and maintaining the extracorporeal circuit during dialysis, methods of disinfection employed on reusable intravascular devices, and procedures and practices relating to administration of parenteral fluids during dialysis. Hypotheses developed about these procedures and devices were tested in the epidemiologic and microbiologic phases of the investigation.

Most of the dialyzers used at CDSI are subjected to a high-level disinfection process after each use and subsequently reused on the same patient. During the latter part of February and early March of 1986, a new procedure for disinfection of reuseable dialyzers was instituted at CDSI. This process uses a commercial germicide (RenNew-D), rather than 4% formaldehyde as had been used previously. The disinfection process was performed manually with both formaldehyde and RenNew-D. All of the dialyzers in use at the time of diagnosis of bacteremia had undergone multiple reuses, having been reprocessed only with RenNew-D between uses. Three of the four cases occurred in patients being dialyzed on their first dialyzer which had been reprocessed with RenNew-D. The staff at CDSI noted a temporal relationship between disinfection with RenNew-D and cases of bacteremia, and thus became concerned that the etiology might be related to the new disinfection method.

Disinfection with RenNew-D allowed for a greater number of reuses of each dialyzer. The number of uses on the four dialyzers being used for the case dialyses was 19, 18, 14, and 4 (mean=13.8). In contrast, the mean [illegible] 6

number of reuses during the first 3 months of 1986 was 9.9. Thus, we hypothesized that increased reuse of dialyzers might be a risk factor for intradialytic bacteremia.

Case Control Study

In order to assess risk factors for intradialytic bacteremia, we performed a case-control study in which three control-patient dialyses were compared to each case dialysis. Control-dialyses were category matched to case-dialyses based upon date and time of dialysis and dialyzer membrane type.

Nursing notes and dialyzer reprocessing records were reviewed in detail for these dialyses. Information abstracted from the charts for both case and control dialyses included time and duration of dialysis, dialysis machine number, dialyzer type and number of reuses, dialysate type, medications administered parenterally during dialysis, and vital signs.

Comparison of case and control dialyses revealed no significant differences between the groups in terms of patient age, etiology of renal disease, duration of hemodialysis, dialysate type, or hemodialysis machine number. All case and control patients had received heparin sodium with preservative and normal saline parenterally during dialysis; no other parenteral medication was administered to more than one of the case-patients. There was no significant difference between cases and controls in total dosage of heparin administered. Volume of normal saline administered was not recorded on the chart.

Comparison of number of dialyzer uses for case and control dialyses revealed that case-patient dialyzers had been used significantly more times than control-patient dialyzers (14.0 vs 8.5, paired t-test, $p \leq 0.05$)

Microbiologic Investigation

Subcultures of all organisms isolated from blood cultures taken from case-patients were obtained from the commercial laboratory used by CDSI (Physicians Reference Laboratory, Huntington Beach, CA.) or the microbiology laboratory at the hospital where case-patients were admitted.

We obtained environmental cultures for microbiologic examination from CDSI. Samples of water taken from various sites in the hemodialysis center were cultured both quantitatively and qualitatively, and endotoxin levels were analyzed by LAL gel-clot formation assay. One dialyzer which had been used on a case-dialysis (that which occurred on 5/2/86) was shipped to CDC for examination. This dialyzer was not disinfected after use, but merely flushed with normal saline. Dialyzers from the first three were not available for examination. These dialyzers had been given by CDSI personnel to representatives of Cobe Laboratories, Inc. and Alcide Corporation for testing.

In addition, samples of fluids administered parenterally during dialysis--sodium heparin and normal saline--were obtained for microbiologic analysis.

The results of identification of patient isolate subcultures and cultures of the dialyzer from case #4 are shown in Table 1. All patients grew at least one species of genus Pseudomonas. Three of the four patients ~~grew~~ ~~multiple~~ gram-negative species ~~from blood cultures~~. Table 2 shows the results of cultures and endotoxin analyses of water and dialysate samples from CDSI. Note that quantitative bacterial counts and endotoxin levels in water samples obtained after reverse osmosis purification (post-R.O. water) were not elevated, though high levels of bacteria and endotoxin were found in some samples of pre-R.O. water. Four of the five species isolated from patient blood cultures were also isolated from environmental sources.

had polymicrobial bacteremia

Cultures of 46 samples of heparin sodium, saline and sterile water for parenteral administration did not show any ~~significant~~ bacterial contamination.

Conclusions

Based upon the epidemiologic and microbiologic results obtained, the following conclusions can be drawn:

1. Four cases of intradialytic bacteremia were diagnosed in CDSI patients approximately 6-10 weeks after the initiation of dialyzer reprocessing with RenNew-D.

2. Review of 4859 dialyses performed at CDSI between January 1, 1986, and May 6, 1986, showed no evidence of an increase in the rate of pyrogenic reactions over that period.

3. Cases of intradialytic bacteremia were significantly more likely to occur among patients being dialyzed on cellulose acetate (CD-4000) dialyzers than among patients being dialyzed on other dialyzer types ~~at a~~ high ~~level of~~ significance.

4. Patients diagnosed with intradialytic bacteremia had a significantly higher number of dialyzer reuses than control patients dialyzed at the same time with the same dialyzer ~~time~~ type.

5. Culture of the dialyzer from one of the four diagnosed cases of intradialytic bacteremia revealed bacterial contamination of both the blood compartment and the dialysate compartment, although a greater number of bacterial species were isolated from the blood compartment.

6. No parenterally administered solutions were implicated as an etiology for these four cases on intradialytic bacteremia.

7. Manual reprocessing of dialyser membranes with RenNew-D is epidemiologically ~~implicated as the etiology of~~ associated with these 4 patients intradialytic bacteremias. We believe that these cases resulted from use of dialyzers which were not sterile at the initiation of dialysis.

Recommendations

1. Critical medical devices or patient-care equipment that enter normally sterile tissue or the vascular system or through which blood flows should be subjected to a sterilization procedure before each use (1).

2. All objects to be disinfected or sterilized should first be thoroughly cleaned to remove all organic matter (blood and tissues) and other residue (1).

3. Items or devices that cannot be cleaned and sterilized or disinfected without altering their physical integrity and function should not be reprocessed. (1)

4. Water used to prepare dialysis fluid should be sampled once a month; it should not contain a total viable microbial count greater than 200 colony forming units (CFU)/ml. The dialysis fluid should be sampled once a month at the end of a dialysis treatment and should contain less than 2000 CFU/ml (1.)

5. Active surveillance should be maintained for adverse reactions which occur during or following hemodialysis. Potentially serious adverse reactions should be recorded in a log book in which clinical, laboratory and epidemiologic information is recorded. ([illegible])

6. Patients who demonstrate symptoms of a pyrogen reaction or bacteremia during or following dialysis should be ~~investigated;~~ assessed clinically & the following diagnostic procedures are recommended:

   A. Physical examination.

   B. Cultures of blood samples and cultures of any additional body fluids or secretions indicated by the physical examination to be likely sources of infection.

   C. Collection of dialysis fluid downstream from the dialyzer for quantitative and qualitative bacteriologic assays.

   D. Collection of dialysis fluid and plasma samples for endotoxin analysis by limulus lysate assay.

~~Due to the fact~~ that dialyzer reuse is a common practice among commercial he~~modialysis~~ centers, we are continuing to investigate ~~this problem~~ the practice of reuse of disposable dialyzers as a source of potentially preventable nosocomial disease.

Because of the preliminary nature of the results explained in this letter, it is possible that any further published reports may present data that are somewhat different from those in this letter. If further analysis substantially alters any of these findings or recommendations, we will notify you immediately. [illegible]

This investigation represented a cooperative effort by members of the CDSI staff, the Los Angeles County Health Department, and CDC. Thank you for your invitation to participate.

Sincerely yours,

John J. Murphy, M.D.	Steven L. Solomon, M.D.
Epidemiology Branch	Assistant Chief
Hospital Infections Program	Epidemiology Branch
Center for Infectious Diseases	Hospital Infections Program
	Center for Infectious Diseases

Lee A. Bland, Jr, M.P.H.
Nosocomial Infections Laboratory
Branch
Hospital Infections Program
Center for Infectious Diseases

cc:

S. Benson Werner, M.D., Infectious Disease Branch, California Department of Health Services

Stephen Waterman, M.D., Los Angeles County Health Department

Marie Reed, Food and Drug Administration

bcc:

Irving Weitzman, FDA

DEPARTMENT OF HEALTH & HUMAN SERVICES

National Institutes of Health
National Institute of Diabetes and
Digestive and Kidney Diseases

Memorandum

Date June 4, 1986

From Special Assistant for Disease Prevention and Technology Assessment, DP&TT

Subject Reuse of Hemodialyzers

To Itzhak Jacoby, Ph.D.
Acting Director, Office of Medical Applications of Research
Through: Associate Director, DP&TT BTD
Through: Acting Director, NIDDK

The Office of Health Technology Assessment (OHTA) has asked the National Institutes of Health for information and advice about the safety and clinical effectiveness of the reuse of hemodialyzers, blood lines, transducer filters and dialyzer caps which are labeled for "single use only" in the treatment of patient undergoing chronic hemodialysis for end-stage renal disease (ESRD). This Institute supported a research contract (NO1 AM 92214) with the National Kidney Foundation entitled "Multiple Use of Hemodialyzers" which was a two year study to provide information on the safety and efficacy of procedures for multiple use of hemodialyzers. It was an in vitro evaluation of the procedures used in processing hemodialyzers for reuse in terms of their retention of function, disinfection, cleanliness, and storage. The final report from the contractor (dated February 9, 1982) concluded that "utilization of the specified procedures with suitable process and quality control will result in a reprocessed hollow fiber hemodialyzer equivalent in terms of function, cleanliness and sterility to a new hollow fiber hemodialyzer." Although widely cited, this conclusion has remained controversial. (It is our understanding that OHTA has a copy of the final report from this research contract. If they do not have a copy, we will gladly provide one for them).

We are aware that reuse of hemodialyzers has become relatively commonplace in centers across the United States providing hemodialysis for patients with ESRD. At the same time, there have not been many reports of complications due to reuse of hemodialyzers which suggests that the practice is reasonably safe. The recent article by Pollak, et al., supports this view (a copy is attached).

The NIDDK has recently entered into an interagency agreement with the Health Care Financing Administration to establish a National ESRD Patient's Registry. This registry will include information about dialyzer reuse and this information may be able to help answer some of the questions about the practice.

It is our understanding that the Food and Drug Administration is developing a comprehensive policy on the reuse of medical devices, in general, that would apply to hemodialyzers, in particular. The Centers for Disease Control have been following this issue with respect to transmission of infection agents through reuse of hemodialyzers. The Association for the Advancement of Medical Instrumentation has also been developing voluntary guidelines for reprocessing of hemodialyzers for reuse. The Institute for Health Policy Analysis at the Georgetown University Medical Center has held two conferences on the issue of reuse of disposable medical devices (March 1984 and October 1985). These agencies and groups should be consulted for additional information.

Stephen P. Heyse

Stephen P. Heyse, M.D., M.P.H.

Attachment

4/25

National End-Stage Renal Disease Patients Registry
Directory
HCFA and NIH Collaborating Staff

Name	Title
Gladys H. Hirschman, M.D.	Director, Chronic Renal Disease Program, NIADDK Westwood Building 5333 Westbard Avenue Bethesda, MD 20892
Anna M. Sandberg, Dr. P.H.	Clinical Trial Coordinator Chronic Renal Disease Program, NIADDK Westwood Building 5333 Westbard Avenue Bethesda, MD 20892
Paul Eggers	Chief, Program Evaluation Branch Health Care Financing Administration 2-C-14, Oak Meadows Building 6325 Security Boulevard Baltimore, Maryland 21207 (301) 594-5883
Sandy Kappert	Program Analysis Officer ESRD Systems Branch Health Care Financing Administration 1-C-15, Oak Meadows Building 6325 Security Boulevard Baltimore, Maryland 21207 (301) 597-2382
Michael McMullan	Acting Deputy Director Office of Statistics and Data Management Health Care Financing Administration 1-F-2, Oak Meadows Building 6325 Security Boulevard Baltimore, Maryland 21207 (301) 597-5989
Henry Krakauer	NIAID/NIH Office of Research Health Care Financing Administration 2C-15, Oak Meadows Building 6325 Security Boulevard Baltimore, Maryland 21207 (301) 597-6540

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United States Senate
SPECIAL COMMITTEE ON AGING
WASHINGTON, DC 20510

June 9, 1986

Honorable John E. Marshall, Ph.D.
Director
National Center for Health Services Research
and Health Care Technology Assessment
Park Building, Room 3-30
5600 Fishers Lane
Rockville, Md. 20857

Attn: Harry Handelsman, D.O.

Dear Dr. Marshall:

As Chairman of the Special Committee on Aging, I am writing to respond to your April 10, 1986 notice in the Federal Register concerning an "Assessment of Medical Technology: Reuse of Hemodialysis Devices Labeled For 'Single Use Only'."

My response consists primarily of the testimony and materials received into evidence on March 6, 1986 during the Committee's public hearing, both pro and con, concerning the reprocessing and reuse of hemodialysis, or dialysis, devices. In addition, I am also enclosing a copy of the petition filed by me and five other members of the Committee calling for the Food and Drug Administration to impose its Good Manufacturing Practice regulations (GMPs) on reprocessors of dialysis devices.

The evidence is more than sufficient to justify the following:

1. Written informed consent and freedom of choice should be required for dialysis patients who are requested to reuse their reprocessed dialysis devices. Patients should be informed in detail of the potential and real risks as well as the benefits of reusing their dialysis devices, and should be permitted to freely decide without fear of reprisal or penalty on whether or not to reuse their devices.

2. It is essential that the FDA impose the GMPs on reprocessors of dialysis devices in order to establish quality control and uniform standards for the safety and wellbeing of those patients who choose to reuse their dialysis devices. There is substantial variance in technique among those dialysis clinics who reprocess and reuse devices. Numerous chemical formulas for "disinfecting" or "sterilizing" dialysis devices are employed by the 600 to 700 clinics engaged in reprocessing. The chemical most often used is formaldehyde, which is known to

be hepatotoxic, carcinogenic, nephrotoxic, mutagenic, hemolytic, anaphylactic, teratogenic, and promotes rejection of organ transplants. Poor quality control and ineffective technique in reprocessing also has resulted in life-threatening and fatal bacterial infection.

3. The Department of Health and Human Services should conduct controlled clinical studies and preclinical studies to determine the safety and efficacy of reusing reprocessed dialysis devices.

I would very much appreciate serious and thorough consideration of my response to your notice of assessment. Should you have any questions regarding this submittal, please contact James Michie or David Cunningham of the Committee staff at 224-5364.

Thank you for your cooperation and assistance in this important matter.

Sincerely,

John Heinz

JOHN HEINZ
Chairman

Enclosures

JH:jfm

DEPARTMENT OF HEALTH AND HUMAN SERVICES

JUN 10 1986

Acting Assistant Secretary for Health

Reuse of Hemodialysis Devices

The Under Secretary
THRU: OS/ES______

Background

On March 6, the Senate Special Committee on Aging held a hearing on "Disposable Dialysis Devices: Is Reuse Abuse?" Both the Public Health Service and the Health Care Financing Administration (HCFA) provided witnesses. For the Public Health Service, John E. Marshall, Director of the National Center for Health Services Research and Health Care Technology Assessment (NCHSR/HCTA) presented testimony, with support from John Villforth, Director of the Center for Devices and Radiological Health of the Food and Drug Administration (FDA). Bartlett S. Fleming, former Acting Deputy Administrator of HCFA also testified. The National Association of Patients on Hemodialysis and Transplantation apparently worked closely with Senator Heinz's staff to provide witnesses.

Senator Heinz, presumably reflecting the concerns of the Association, emphatically pursued the following issues:

1. Clinical trials should be conducted to ascertain the safety of dialyzer reuse. The particular concern expressed was over the potential short term toxicity or long term carcinogenic effects of the use of formaldehyde solution as a disinfectant in the reprocessing. The concern was that trace amounts (3-5ppm) of formaldehyde are present in the dialyzer and may enter the patient's blood.

2. Senator Heinz insisted on the necessity of Federal standards, with associated compliance monitoring, for reprocessing. Senator Heinz argued that the reprocessing should be subject to the Good Manufacturing Process procedures of the FDA.

Facts

The Department's witnesses emphasized the following points both in the testimony and in their responses to the Senator's questions.

1. As Medicare reimbursement for dialysis has been reduced, there has been a great increase in the reuse of dialyzers. Since 1981, there has been a threefold increase in the number of patients receiving dialysis in centers which reuse the dialyzer. Yet there has been no increase of mortality or morbidity. In 1981, the cost of a dialyzer was in the $28-$30 range. The cost is presently in the $10-$12 range. The cost for reprocessing a dialyzer is in the $7-$8 range. The practice of reuse is largely driven by the size of the facility. Large, high volume facilities find it cost effective to reprocess. Facilities with very small numbers of dialysis units and patients tend to use a new unit each time.

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HSR	Marshall	6-6						

☆ U.S. GOVERNMENT PRINTING OFFICE: 1983—419-531

DEPARTMENT OF HEALTH AND HUMAN SERVICES
Page 2 - The Under Secretary

2. The decision on when to use a new dialyzer is a medical decision and not one appropriate either for FDA or HCFA intervention.

3. There is no apparent need for Federal regulation or monitoring. FDA and CDC have been actively involved in the development of voluntary standards. Those standards have been available in draft and should be published as a final product before the end of 1986.

4. The FDA has contracted with the Health Departments of three States and the District of Columbia to investigate the nature and frequency of user problems with hemodialysis, including reuse. Analysis should be completed during 1986. This is part of a larger FDA effort to develop a comprehensive policy on reuse for all medical devices.

5. At the hearing, Dr. Marshall agreed to conduct an assessment of the current literature and other information associated with reprocessing and reuse. That assessment will be completed on June 10 and will be transmitted with recommendations to HCFA at that time. NCHSR/HCTA has found no evidence contradictory to the position which we took in testimony. The recommendation to HCFA will be that FDA should continue to participate in the development of voluntary standards for reprocessing and reuse and that HCFA should include an instruction to address these standards when the State-based survey organizations review individual dialysis facilities. The literature does not suggest the need for clinical trials.

/s/ [illegible]
Donald Ian Macdonald, M.D.

PREPARED BY JOHN E. MARSHALL:NCHSR/HCTA:6/6/86:443-5650:Park Bldg., Rm. 3-30

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DEPARTMENT OF HEALTH & HUMAN SERVICES
Health Care Financing Administration

Washington, D.C. 20201

JUN 13 1986

The Honorable John Heinz
United States Senate
Washington, D.C. 20510

Dear Senator Heinz:

This letter is to inform you of the actions taken by the Health Care Financing Administration (HCFA) relative to the first panel of witnesses who testified at your March 6, 1986 dialyzer reuse hearing. As you recall, I promised that we would investigate the specific concerns and issues raised by Melinda McFadden and Vagn Vogter. Both Ms. McFadden, a dialysis patient at Bio-Medical Applications, Inc. (BMA) of Central Philadelphia, and Mr. Vogter, a dialysis patient at South St. Petersburg (Florida) Artificial Kidney Center, expressed concern that their respective dialysis centers had forced them to reuse disposable hemodialysis devices.

We are pleased to report that Ms. McFadden's case appears to have been resolved. Staff from our Philadelphia regional office telephoned Ms. McFadden on April 22, 1986 and again for follow-up on May 2, 1986. In both instances Ms. McFadden reported that she was doing well and that improvements regarding patients' rights had been made at her dialysis facility. In the April 22 telephone interview, Ms. McFadden specifically reported that the center has a new patient Bill of Rights, that patients are being informed about BMA's grievance procedures, that the center maintains informed consent policies and, lastly, that the center will notify patients about any national information concerning their care and services. In the follow-up conversation of May 2, Ms. McFadden continued to state that she was doing well and that her spirits were up. She also reported that the center is providing more information to patients and is explaining medical procedures about dialysis.

Mr. Vogter's case is presently being dealt with by our Atlanta regional office. Staff from this office had previously scheduled a Federal monitoring survey at South St. Petersburg Artificial Kidney Center during the early part of June 1986. During this visit, they will investigate Mr. Vogter's case. I will report to you the results of this investigation when they become available to us.

The other two witnesses, Robert Rosen, a dialysis patient and Chairman of the National Kidney Patients Association, and Malcolm Shuman, surviving son of former Baton Rouge dialysis patient, Elaine Menville Shuman, did not voice specific concerns at the March 6th hearing which required follow-up HCFA investigation. For your information, however, a complaint investigation was conducted at BMA of Central Philadelphia on December 27 and 30, 1985 in response to allegations which Mr. Rosen previously shared with HCFA's Philadelphia regional office. This investigation revealed one Federal deficiency concerning the center's official policy and procedure manual not including a segment on the rules and regulations governing patient responsibilities and conduct.

The deficiency was subsequently corrected in a timely fashion by the facility's administrator. Mr. Rosen's other allegations regarding patient care and services, patient rights and grievance procedures, the physical environment of the center, and patient clinical records were not found to be deficient in the December investigation.

At the March 6, 1986 hearing Malcolm Shuman discussed his Mother's care at the BMA dialysis facility in Baton Rouge, Louisiana. As you are aware, in 1982 an outbreak of nontubercular mycobacterial infection was reported at this facility which infected 140 patients, 14 of whom subsequently died. A Centers for Disease Control (CDC) investigation of this case found the cause of the outbreak to be water contamination by mycobacteria. A December 6, 1985 Dallas regional office survey of this facility indicated favorable compliance with no major deficiencies in Federal regulations noted. Furthermore, the facility, which practices reuse, maintains grievance procedures and informed consent policies for all patients.

Though HCFA's policy has always been that the decision to reuse is a medical practice issue, which should be decided by a patient's physician, we do not, and will not, tolerate facilities which "force" their patients to reuse at the risk of being denied treatment. We will continue to monitor ESRD facilities as part of our survey and certification process and will investigate all patient complaints.

We hope you find this information helpful. If I can be of any additional assistance, please do not hesitate to contact me.

Sincerely,

Bartlett S. Fleming
Associate Administrator for
Management and Support Services

NAPHT
NATIONAL ASSOCIATION OF
PATIENTS ON HEMODIALYSIS
AND TRANSPLANTATION, INC.

THE VOICE OF ALL KIDNEY PATIENTS

150 Nassau Street
New York, NY 10038
(212) 619-2727

Dr. Frank E. Young
Commissioner,FDA
14-71 Parklawn Building
5600 Fishers Lane
Rockville, MD 20857
19 June 1986

Dear Dr. Young,
Enclosed you will find a copy of a letter sent to a patient named Sarah Wager by her nephrologist. Ms. Wager has refused to allow herself to be subject to reuse of her dialyzer as she feels that thrice weekly exposure to formaldehyde poses a significant health risk to her.

I am also enclosing a copy of a form which allegedly passes for informed consent. In addition to being riddled with typographical errors the form mistates what is known about reuse: For example, the form states,"Chemistry clearances and ultrafiltration are not adversly affected and in many instances improve." In point of fact, there is a decline in the efficiency of a dialyzer after one use and nowhere in the literature can one find a citation stating that dialyzer efficiency improves with more than one use. If this were the case people would line up and insist on reusing.

Ms. Wager is the President of our New Orleans Chapter. She taught school and is now retired and devotes her time to working as a volunteer for NAPHT New Orleans and for the National Kidney Foundation. She lives in Metairie and the facilities listed on her 30 day letter are all in New Orleans. This would mean that she would need to seek alternative means of transport to and from dialysis three times per week. This would put additional burden on Ms. Wager, her family, and the Medicaid system.

INSURING ACCESS AND SAFEGUARDING QUALITY OF CARE

NAPHT
NATIONAL ASSOCIATION OF
PATIENTS ON HEMODIALYSIS
AND TRANSPLANTATION, INC.
THE VOICE OF ALL KIDNEY PATIENTS

150 Nassau Street
New York, NY 10038
(212) 619-2727

This is why we are writing to you in support of the petition sent by Senator John Heinz and his colleagues urging the FDA to adopt Good Manufacturing Practices for the reuse of hemodialyzers. Ms. Wager has been bold enough to make a public case of this; there are many patients who are simply too frightned to do the same thing. We urge you to act quickly on a matter of urgent concern to 80,000 plus dialysis patients.

Yours sincerely,

Stuart Kaufer
Executive Director

ST. CLAUDE DIALYSIS CENTER
2435 St. Claude Ave.
New Orleans, LA 70117
(504)949-0194
Office Ph. # (504) 885-7561

June 6, 1986

Ms. Sarah Wager
3912 Delhi Street
Metairie, Louisiana 70001

Dear Ms. Wager:

By this letter we the undersigned wish to inform you that as of thirty (30) days from the date of this correspondence we will no longer be able to provide treatment and dialysis to you. As you know, our dialysis centers are beginning to use reusable filters as is the case for the majority of dialysis centers throughout the nation and the overwhelming majority in the New Orleans area. We have investigated the other dialysis centers in the New Orleans area and have found that you can receive treatment at the following centers all of whom employ one time use filters:

Touro Infirmary
1401 Foucher Street
New Orleans, Louisiana

Tri-Parish Renal Center
2359 St. Claude Avenue
New Orleans, Louisiana 70117

Southern Baptist Hospital
2700 Napoleon Avenue
New Orleans, Louisiana 70115

We will continue to provide treatment for you on a non-reuseable basis for the next thirty (30) days but due to the fact that all of our facilities will have been converted to reuseable filters it will be impossible for us to provide treatment to you after that time. If you have any questions regarding this matter beyond those which we have already discussed we would be happy to discuss it with you further. If you wish assistance in making an appointment at one of the centers listed above please feel free to contact Mrs. Denise Larsen at 885-7561.

Very truly yours,

Mustafa Hatipoglu, M.D.

Abdolamir Lehimgar-Zadeh, M.D.

ST. CLAUDE DIALYSIS CENTER
2435 ST. CLAUDE AVE.
NEW ORLEANS, LA 70117

CONSENT TO REPROCESS (REUSE) DIALYZERS

There are several types of dialyzers (artificial kidneys) available. The hollow fiber dialyzer will provide our patients with the latest technology in dialyzer design and is believed to be the dialyzer of choice for our patients at St. Claude Dialysis Center ESRD Unit. However, this dialyzer is more costly than the other types. The cost of the dialyzer, when coupled with other increasing costs and decreased reimbursements, has caused us to devise a reprocessing procedure for the capillary flow (hollow fiber) dialyzer.

Based on studies done at other hospitals and kidney units and research documented in the medical literature, it has been determined that reuse is an acceptable and safe procedure. At present 62% of dialysis centers are using reuse.

Chemistry clearances and ultrafiltration are not adversely affected and in many instances do improve. There is a decreased instance of membrane reaction with reused dialyzers.

Reprocessing of the dialyzers at St. Claude Dialysis Center will be accomplished through the use of a computerized automated dialyzer reprocessor. This equipment identifies, cleans, rinses, tests, disinfects, and documents the reprocessing procedure. The kidney is filled with a solution of formaldehyde prior to storage. No known organisms can live in formaldehyde. The kidney is labelled with your name.

There are some inherent problems which may occur with reuse. The possible problems are as follows:

1. Running on another patient's kidney.
    a. Each kidney will be labelled before being taken to the reuse area.
    b. After being cleaned, it will be stored in a sealed bag with your name on it and with the reprocessing document.
    c. Kidneys will be checked by the technician and nurses, prior to priming it for your dialysis.
    d. As an added safety measure, you should check your kidney to see if your name is on it.
    e. In the event you did receive the wrong kidney, there is no reason to believe that any adverse reaction would occur due to the antibacterial action of formaldehyde. Remember: No known organism can live in formaldehyde.
2. Pyrogen Reaction.
    This condition manifests itself as fever and chills during dialysis.
    b. By using the automated reprocessing machine, each kidney goes through multiple water rinses, reverse ultrafiltration, and ultrafiltration and pressure testing prior to being filled with 4% formaldehyde solution. Each step of the procedure is documented on a computer print-out which will be packaged with the kidney after reprocessing and will be available for you to inspect.

   c. If this reaction should occur, the symptoms can usually be rapidly corrected by taking Tylenol and/or Benadryl.

3. Formalin Reaction.
   a. This reaction is caused by improper rinsing of the kidney when it is being set up for your dialysis.
   b. This situation is avoided by using a dual process:
      1. The kidney is rinsed with 1000cc of saline after the dialysate has run through the kidney for 10 minutes.
      2. A Schiff's test is done to measure for any residual formalin. A clear result indicates there is no formalin present. The test tube is left on your machine until after initiation of dialysis. If there are no ill effects noted, the technician or nurse who ran the test will initial the nurse's notes in the appropriate area.

As an added precaution, you should get in the habit of checking your test tube and the name that is on your kidney.

ST. CLAUDE DIALYSIS CENTER DOES NOT REUSE KIDNEYS FROM PATIENTS WHO ARE HAA+ OR THAT HAVE ELEVATED LIVER ENZYMES.

We feel that reuse is a vital part of our operation in order to provide you with the best possible care and equipment.

If there is any part of the reuse operation about which you are in doubt, please, contact the head nurse or your physician at your earliest convenience.

****

I have carefully read and reviewed the above information and do hereby give St. Claude Dialysis Center full permission to reuse my dialyzer.

______________________________ ______________

Signature of Patient Date

____

Signature of Responsible Party if Patient is a Minor/Relationship

____

Date

______________________________ ______________

Signature of Witness Date

MEMORANDUM OF MEETING

Firm: Alcide Corporation
Norwalk, CT

Cobe Laboratories, Inc.
Lakewood, CO

Participants: FDA Representatives

Dr. Marlene E. Haffner, Director, OHA, HFZ-70
Dr. Ann A. Holt, Deputy Director, OC, HFZ-300
Dr. Fernando Villarroel, Director, DGGD/CDE, ODE, HFZ-420
James J. Park, DGGD, ODE, HFZ-420
Dr. Zory R. Glaser, Senior Scientist, DLS, OST, HFZ-112
Michael F. Audet, DPP, OTA, HFZ-250
Dr. Francis S. Casciani, ODE, DGGD, HFZ-420
Marie H. Reid, DPS, OC, HFZ-343
William H. Damaska, Director, DCO, OC, HFZ-320
Susan E. Bounds, Acting Chief, RNB, HFZ-321

and

Centers for Disease Control, Atlanta, GA

Steve Solomon, CDC
Lee Bland, CDC

and

Alcide Corporation

Harry M. Kaufman, Vice President, Regulatory Affairs
Bruce L. Lev, Attorney
Bob Kross, Vice President, Research & Development
Kathy Schultz, Clinical Coordinator

and

Cobe Laboratories, Inc.

Lloyd J. Forrestal, Director, Quality Assurance
Joseph R. Radzius, Attorney
Vera Buffaloe, Director, Regulatory Affairs

Date: June 20, 1986

The meeting was held at Cobe Laboratories' request to update all parties on what had transpired to date concerning the RenNew-D sporicide/disinfectant problem. Cobe also wanted to reach a common understanding of what is to be done and the technique to be used to study the problem further.

The following information was provided by the Alcide and Cobe Laboratories' representatives, primarily Ms. Buffaloe, Mr. Kaufman, and Dr. Forrestal.

Four (4) dialysis clinics have had patient "pyrogen-like" reactions on hemodialysis equipment disinfected with Alcide RenNew-D. The Inglewood, California clinic had 4 patients affected. Three of the 4 patients were on regenerated cellulose acetate membranes, not Cuprophan. The Daytona, Florida clinic had 7 patients affected. The Napa Valley clinic in California had 2 affected patients. Six (6) patients were affected at the Dallas, Texas clinic.

The Alcide Corporation RenNew-D 510(k) was determined to be substantially equivalent in May 1985. The product was introduced into the market at a few centers in November 1985. In January 1986 full scale marketing of the product began. The limited marketing between November and January was at closely monitored dialysis centers so that RenNew-D could be field validated. After full scale marketing began, approximately 70 centers began using the product. Until about 5 weeks ago only about 3 treatment centers changed back from RenNew-D to another disinfection method after trying the product.

The 510(k) was found to be substantially equivalent for use with hollow fiber, e.g., Cuprophan, cellulose acetate or regenerated cellulose membranes. Cobe Laboratories and Alcide Corporation decided in November 1985 to limit the use of RenNew-D to Cuprophan membranes because there was limited clinical experience with the other membranes, plus Cuprophan constitutes 80% of the market. There were no adverse data that influenced the use being limited to Cuprophan.

To date approximately 2,500 patients have been dialyzed with RenNew-D treated membranes. This is approximately 130,000 reuses, or about 30,000 reuses per month. Some kidney treatment centers are using RenNew-D exclusively, some are not.

During the latter part of March 1986, Cobe was informed of a patient reaction in the Daytona Beach Community Dialysis Center. Cobe and Alcide sent people to investigate. They found a problem with the quality of the water supply. There are several dead legs in the system. There also had been a break in the water line and no additional disinfection of the water following the repair. The water was tested with LAL for pyrogenicity in different parts of the system. High levels of endotoxins were found.

The conclusion at that time was that the Daytona water problem in the clinic resulted in the patients' adverse reactions. The Daytona Center went back to formaldehyde to disinfect membranes at that time. Cobe made recommendations to the Daytona Center on ways to clean up the water supply.

Then the Community Dialysis Center in Inglewoood, California reported to Cobe that it was experiencing problems with patients developing "pyrogen like" reactions. The patients also had positive blood cultures for microorganisms. Again, both firms went in to investigate. The Inglewood Center was not using the proper technique to fill the dialyzers with RenNew-D. Also, this center had a reverse osmosis (R.O.) water unit that had a bypass when the water supply pressure was inadequate to feed the R.O. unit.

Next, the Napa Valley Community Dialysis Center, using automated equipment to disinfect the dialyzers, experienced "pyrogen-like" reactions in some patients. The firms investigated there as well. They discovered that the system was broken and the treatment center had a home made aspiration system that did not effectively fill the dialysis equipment. The kidney center was also not following the manufacturer's directions for use.

At that point Alcide proposed a Technical Bulletin be issued to all users. It would emphasize that the directions for use must be followed and that the water quality meet certain standards for pyrogens.

On June 5, 1986 the Dallas Kidney Disease Center reported "pyrogen-like" reactions in patients. This kidney center had been part of the early marketing trials. When the firms investigated they found that the kidney center's filling technique was satisfactory. However, the kidney center's staff was not checking the potency of the mixed RenNew-D according to the directions for use. This clinic also experienced problems with cloudiness in the mixed RenNew-D. When the cloudy mixture was stirred, it cleared but failed the potency test. Water from the R.O. unit contains high concentrations of calcium. Water used to mix the RenNew-D that passed only through the R.O. unit produced subpotent disinfectant after 24 hours. The RenNew-D mixed with water that passed through the R.O. and carbon filter passed the potency test after 24 hours. The potency decreased after storage for 2-3 days (the labeling states that the shelf life of the mixed solution is 7 days). The water supply after R.O. contained 15 microorganisms per ml but after the carbon filter it was 5,000-10,000 microorganisms per ml. The AAMI water standard for dialysis is less than 200 microorganisms per ml. Dallas had experienced drought conditions and the water supply at Dallas had 1.5-1.7 ppm of chlorine in it. There was some speculation that chlorine deactivates RenNew-D.

The following Friday, June 13, Cobe Laboratories decided to survey 10 clinics that were not experiencing problems with the product. They sampled RenNew-D from the blood side of RenNew-D disinfected dialyzers. Six portions of this sample were cultured and a portion of it was challenged with Pseudomonas aeruginosa. The recirculating saline used to prime the dialyzer was also sampled after five minutes of circulation. The reconstituted unused RenNew-D and water supply were sampled also. The water treatment systems at each clinic were documented. The same samples and techniques were also being used at the Dallas clinic.

On Monday, June 16, the firms were preparing a Safety Alert, but Tuesday morning the Dallas clinic reported two more reactions. One of the patient's systems had been sampled as described above. The recirculated saline cultured gram negative rods and the patient's blood culture was positive for Pseudomonas.

By that time the results from the 10 clinic survey began coming in to Cobe. One clinic had a positive sample from the recirculating saline solution for a gram negative rod. Because the cause of the contamination and loss of potency is not known, Cobe Laboratories and Alcide decided to recall RenNew-D.

On the afternoon of June 17 Cobe Laboratories began telephoning all RenNew-D consignees to stop using the product and return all stock to Cobe. Cobe Laboratories is the subrecalling firm and sole distributor of RenNew-D. The recalling firm is Alcide Corporation. By June 19 all consignees had been contacted by telephone. A mailgram/recall letter will be sent to them Monday, June 23. Also, beginning Monday, June 23, Cobe field representatives will visit the users to facilitate the return of any RenNew-D to Cobe. The field representatives will also pick up RenNew-D packed dialyzers saved at the request of Cobe. The RenNew-D packed dialyzers will be available if needed for the ongoing study.

The challenged RenNew-D sampled at the 10 clinics indicated total kill of the challenge organism. The RenNew-D samples from the mixtanks are expected to be negative for microorganisms as well. They are still incubating. There were 121 saline samples taken at the 10 clinics. Eleven were positive for bacteria. One hundred and twenty-four (124) dialyzer RenNew-D samples from stored dialyzers were negative for bacterial growth. The same number of dialysis RenNew-D samples were P. aeruginosa challenged and no growth has appeared to date. Incubation of them is continuing. Of 121 samples of saline used to rinse the same dialyzer from which the RenNew-D samples were obtained, 11 were found to be positive for bacteria.

Blood compartments of the dialyzer appear to be initially free of microorganisms but microorganisms are present in the dialysate. Reusing of the dialyzer consists of recirculated saline through the blood compartment of the dialyzer while the dialysate is also circulating for 5 minutes.

There appears to be no correlation between the numbers of reuses (2-47) and the extent of patient reactions. The affected clinics were using carbonate and/or acetate dialysates. Alcide Corporation is convinced that the problem is not batch related.

The Centers for Disease Control's (CDC) representatives reported preliminary results from the Dallas Clinic. CDC is culturing 130 RenNew-D samples from the blood side of dialyzers. There is no growth to date. Cultures were also taken of 109 recirculating saline samples. To date 11 of these are positive. The patient blood culture results are not yet available.

A hypothesis was presented by Dr. Villarroel that the RenNew-D may be affecting the integrity of the dialysis membrane and suggested bacteriological tests. Cobe and Alcide had not considered this possibility and stated that they will perform tests to assess it.

There was some discussion about whether CDC or FDA would like RenNew-D and RenNew-D packed dialyzers from the clinics to test. The preservation and handling of the packed dialyzers was also discussed. No decisions were made about CDC or FDA testing. Generally, the FDA representatives decided that CDC has the lead for testing.

The requirements of the MDR regulation were briefly covered. An Alcide representative stated that he will comply with them.

Susan E. Bounds

Prep:SEBounds:6-23-86; Initial:LJStauffer:6-23-86; R/D:VTran:6-23-86;
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Comments/Initial:Haffner/Holt/Villarroel/Glaser/Damaska/Reid:7-7-86;
Revised:SEBounds:7-10-86; Redrafted:VTran:7-11-86; Edited:RGCox:7-11-86;
F/C:VTran:7-11-86;

cc: All FDA Attendees HFZ-321/3 HFR-1195 HFR-8195

jw 7-17-86

DEPARTMENT OF HEALTH & HUMAN SERVICES
Public Health Service

Centers for Disease Control
Atlanta GA 30333

June 20, 1986

Dr. Enrique D. Carter
Director
Office of Health Technology Assessment
Park Building, Room 310
5600 Fishers Lane
Rockville, Maryland 20857

Dear Dr. Carter:

I have discussed the information you requested regarding the reuse of hemodialyzers and other specified ancillary equipment with James M. Hughes, M.D., Director, Hospital Infections Program (HIP); Julia S. Garner, R.N., M.N., Chief, Prevention Activity, HIP, and Martin S. Favero, Ph.D., Chief, Nosocomial Infections Laboratory Branch, HIP. The Hospital Infections Program has the responsibility for performing surveillance of a variety of dialysis-associated diseases as well as infection control strategies and disinfection and sterilization practices used in dialysis centers. I have enclosed several reprints of publications concerning this surveillance system and the type of information it provides us.

CDC does not recommend for or against the reuse of hemodialyzers. In the early 1980s, we have observed a significant increase in the number of hemodialysis centers that reuse dialyzers meant for one-time use. This increase appears to have been stimulated by economic considerations. In the period from 1976 through 1985, we have not detected any difference in the incidence of hepatitis B infections nor pyrogenic reactions among patients dialyzed in centers that do reuse hemodialyzers as compared to centers that do not reuse hemodialyzers. However, the sensitivity of this surveillance system, described in the enclosed reprint by Alter et al., from *Dialysis and Transplantation*, has not been assessed.

In 1983, there was an outbreak of nontuberculous mycobacterial infections among patients in a hemodialysis center in Louisiana (see enclosed reprint of paper by Bolan et al.). The probable source of the nontuberculous mycobacteria was water used to rinse dialyzers and to prepare formaldehyde solutions used as disinfectants. It was shown conclusively that the practice of using 2% formaldehyde was a marginal disinfection procedure and that when nontuberculous mycobacteria were present in waters exposed to the reprocessed dialyzers, these organisms constituted a severe challenge to the disinfectant used. Shortly thereafter, for centers using formaldehyde as a disinfectant in reprocessing dialyzers, it was recommended that at least 4% formaldehyde, or an equivalent germicide (there are several commercially available chemical germicides on the market specifically formulated to disinfect dialyzers) be used.

Currently, our surveillance activities show that approximately 58% of all the licensed dialysis centers in the United States reprocess hemodialyzers and that 65% of all dialysis patients in chronic dialysis programs are dialyzed in centers that reprocess dialyzers. When disinfection is performed adequately, the theoretical health risks from dialyzing a patient with a reprocessed dialyzer may be the same or less than dialyzing a patient with a new dialyzer (see enclosed paper by Ogden). In fact, some centers prefer to reprocess new dialyzers prior to using them to dialyze a patient in order to eliminate the risk of "new dialyzer" syndrome. It is our impression that most centers in the United States routinely process new dialyzers in exactly the same manner as dialyzers that are reused. For example, in the dialysis center where the outbreak of nontuberculous mycobacteria occurred, infections were associated with dialyzers used for the first time as well as with those that were reused.

We believe that guidelines specifying procedures for reprocessing dialyzers (see the AAMI Guidelines and the National Kidney Foundation Guidelines) are reasonable. If the reprocessing procedure is done correctly with an effective disinfectant, there does not appear to be any significant risk to patients.

We have no data on the reuse of blood lines, transducer filters and dialyzer caps. To our knowledge, there are no guidelines or recommendations that extend to these devices.

There is no question that the practice of reprocessing dialyzers is stimulated significantly by economic considerations. However, our colleagues in the nephrology community point to other advantages. These include the elimination of new dialyzer syndrome and the increasing evidence that the biocompatibility of membranes of reused hemodialyzers and the patient's blood results in fewer adverse reactions.

Finally, the emergence of "high flux" short duration dialysis treatment with use of specialized dialyzers that cost 3 to 4 times more than those currently used may increase the practice of dialyzer reuse even further.

If we can be of any further help, please let us know.

Sincerely yours,

Gary

Gary R. Noble, M.D.
Assistant Director for Science

13 Enclosures (see enclosed listing)

Listing of Enclosures

1. Alter MJ, Favero MS, Petersen NJ, et al. National Surveillance of Dialysis-Associated Hepatitis and Other Diseases 1976 and 1980. Dialysis and Transplant 1983;12:860-865.
2. Bolan G, Reingold AL, Carson LA, et al. Infections with Mycobacterium chelonei in Patients Receiving Dialysis and Using Processed Hemodialyzers. J Infect Dis 1985;152:1013-1019.
3. Ogden DA. Clinical Responses to New and Reprocessed Hemodialyzers, 1986.
4. Guideline for Handwashing and Hospital Environmental Control, 1985. U.S. Department of Health and Human Services, PHS, CDC, Atlanta, GA, 1985.
5. National Kidney Foundation. Revised Standards for Reuse of Hemodialyzers (draft), 1983.
6. AAMI. Recommended Practice for Reuse of Hemodialyzers (proposed), 1985.
7. Bland L, Alter M, Favero M, et al. Hemodialyzer Reuse: Practices in the United States and Implication for Infection Control. Transactions ASAIO 1985;31:556-558.
8. Alter MJ, Favero MS, Maynard JE. Hepatitis B Vaccine Use in Chronic Hemodialysis Centers in the United States. JAMA 1985;254:3200-3202.
9. Alter MJ, Favero MS, Francis DP. Cost Benefit of Vaccination for Hepatitis B in Hemodialysis Centers. J Infect Dis 1983;148:770-771.
10. Alter MJ, Favero MS, Maynard JE. The Impact of Infection Control Strategies on the Incidence of Dialysis-Associated Hepatitis in the United States. J Infect Dis 1986 (in press).
11. Alter MJ, Favero MS. National Surveillance of Dialysis-Associated Hepatitis and Other Diseases in the United States, 1984 (preliminary report).
12. Favero MS. Distinguishing Between High-Level Disinfection, Reprocessing, and Sterilization. AAMI Technology Assessment Report 1983;6:19-23.
13. Favero MS, Deane N, Leger RT, et al. Effect of Multiple Use of Dialyzers on Hepatitis B Incidence in Patients and Staff. JAMA 1981;245:166-167.

DEPARTMENT OF HEALTH & HUMAN SERVICES

Public Health Service

Rockville MD 20857

National Center for Health Services Research
and Health Care Technology Assessment

5600 Fishers Lane
Room 310, Park Building

JUN 24 1986

NOTE TO BOB RICKARD

This is to provide you with an update on the status of the Public Health Service assessment on Reuse of Hemodialysis Devices Labeled for "Single Use Only."

In Dr. Macdonald's original request for the assessment, a 60-day turnaround time was sought. This would have required completion of the assessment by June 10 which coincided with the closing period for comment stipulated in the Federal Register notice of April 10. On the last day of the comment period, Senator Heinz submitted a voluminous amount of new material to Dr. Carter and his staff. Because we had to review and address the Senator's submission, we were unable to meet our deadline, including the Executive Secretariat's due date of June 13.

We have now completed our review of this material and are incorporating it into the assessment report which I hope to have available for the ASH at the earliest possible date.

Enrique S. Carter MD for
John E. Marshall, Ph.D.

TRACER
72639

DEPARTMENT OF HEALTH & HUMAN SERVICES
Public Health Service

Memorandum

Date JUN 25 1986

From Deputy Director
Center for Devices and Radiological Health, FDA

Subject Recall of Hemodialysis Disinfectant - INFORMATION

To Director
National Center for Health Services Research

Knowing of your interest in dialysis reuse, OHTA's ongoing assessment of reuse safety, and your involvement in preparing the Undersecretary for a recent meeting on renal dialysis, I want to alert you to a situation concerning a disinfectant used in dialyzer reprocessing.

Over the last couple of months, we have become aware of outbreaks of pyrogen-like reactions and/or bacteremia in patients who had been dialyzed with membranes that had been disinfected with RenNew-D. This product is a sporicide/disinfectant manufactured by Alcide Corp. of Norwalk, Conn. and distributed exclusively by Cobe Laboratories of Lakewood, CO. The outbreaks involved four centers (two in California, one each in Florida and Texas), each involving several patients.

On-site inspections have been performed by local health department personnel in tandem with CDC. Those inspections corroborated the link between the patient reactions and the disinfectant. Specifically, it was found that the RenNew-D solutions were not holding their potency beyond 24 hours; according to their labeling, potency should have been maintained for one week. Moreover, evaluation of actual product samples revealed the presence of gram-negative bacteria.

In addition to the joint CDC-health department inspections, we have discussed the problem directly with the company and the distributor. On June 17, the company began notifying all dialysis centers (about 75 in all) to cease using RenNew-D and to return unused supplies. A recall letter was subsequently issued on June 23 by Alcide and the distributor is now in the process of conducting site visits to ensure compliance with the recall. Based on the company's actions and our own health hazard evaluation, we are proceeding to classify Alcide's action as a class I recall (this designation indicates a critical public health problem demanding follow-up monitoring by FDA).

In addition, CDC plans to issue an MMWR article this Friday to inform physicians of its findings in connection with these incidents, and to advise them to stop using this product (a copy of the latest draft is attached). I should also mention that staff from Senator Heinz's Aging Committee have been in touch with us and CDC about this problem.

Again, I am conveying this information to you because of the heightened interest in the dialysis reuse issue and your continuing role in this area. Should you have any questions concerning this situation or how it is being handled, please give me a call.

James S. Benson

cc: Dr. Young
Mr. Villforth
Dr. Carter

DEPARTMENT OF HEALTH & HUMAN SERVICES
Public Health Service

Food and Drug Administration
Rockville MD 20857

JUN 25 1986

NOTE TO: The Commissioner
Through: Exec Sec ______

Frank,

Last Friday, I sent you a note describing a situation involving a sporicide/disinfectant used to reprocess hemodialysis equipment. I want to update you on what's transpired since then and to forecast what may result from this series of incidents.

Alcide Corp., the manufacturer of RenNew-D (the disinfectant involved), began notifying by phone the 75 or so dialysis facilities which use the product of the problem of pyrogen-like infections and/or bacteremia. Phone notification was completed within two days. The firm issued a recall letter on June 23 which we approved prior to its release. Based on the company's actions and the results of our own health hazard evaluation, Paul Hile felt we should get a recall letter out this week. On Tuesday, we sent to ORA for sign-off our class I recommendation and a suggested letter to the firm (see Tab A). Based on discussions earlier today with Jack Martin, we are also developing a talk paper on this situation and the actions taken by both the agency and the company.

In my last note, I alluded to CDC's intent to issue an MMWR article on this problem. We've been told that CDC plans to release the article this Friday (a copy of the latest draft is enclosed at Tab B). Our staff have been in contact with both the authors of the article and reviewing officials to suggest some changes to bring it in line with the statements about dialysis reuse made by Dr. John Marshall and John Villforth at the Congressional hearings on this subject this past March. I should note that due to Dr. Marshall's involvement in this area, I've sent a memo to him outlining this latest incident and what steps have been taken (copy at Tab C). Given CDC's press deadline, we also spoke with him by phone this afternoon to alert him to the MMWR and the planned release on Friday.

Finally, you should be aware that staff from Senator Heinz's Aging Committee are taking an active interest in this Alcide issue. They have been in touch with our staff and individuals at CDC. Given the Senator's intense interest in the reuse issue (as evidenced by his petition to FDA calling for GMP coverage for reprocessors and his recent legislation to assure that patients are forewarned about reused dialysis equipment), it's possible that additional hearings might be held. If new hearings were to come about, it's likely that Senator Heinz would use the Alcide problem as a "case study" to exert more pressure on FDA to apply regulatory controls to reprocessors.

We'll keep you posted as further developments warrant.

Jim

James S. Benson
Deputy Director
Center for Devices
and Radiological Health

Enclosures

cc: Mr. Hile
Mr. Cannon
Mr. Martin
Mr. Villforth

TAB C

CDRH RECALL STRATEGY

Product: RenNew-D Sporicide/Disinfectant

Recalling Firm: Alcide Corporation
Norwalk, CT

Subrecalling Firm: Cobe Laboratories
Lakewood, CO

Reason for Recall: Four dialysis centers have had patients experience pyrogen like reactions and/or bacteremis. The reactions are associated with the use of RenNew-D to disinfect dialysis equipment.

Firm's Action to Date: On June 17 Cobe Laboratories telephoned clinics that experienced patient reactions and told them to immediately stop using RenNew-D. On June 18 and 19 all other end users were telephoned and advised to stop using the product. All users were asked to separate all RenNew-D packed dialyzers and the product so that they can not be inadvertently be used.

Cobe sales representatives will visit all accounts the week of June 23 to ensure that the recall instructions are followed and to facilitate the return of the product. The recall letter/mailgram will be sent to all users June 23. All of the product that is returned to Cobe Laboratories will be returned to Alcide Corporation.

Class: I

Depth: User

Firm Effectiveness Check: Level A - The firm's recall strategy appears to provide for 100% effectiveness checks. Cobe and Alcide are to retain records for FDA review.

FDA Audit Check: Level B - Field to audit 37 users for recall effectiveness.

Publicity: FDA Enforcement Report only.
CDC will publish its findings in the MMWR June 27 or July 4.

Need for Action Memorandum: Yes

PREPARED/SIGNED BY: Susan E. Bounds, 6/23/86

DEPARTMENT OF HEALTH AND HUMAN SERVICES

National Center for Health Services Research
and Health Care Technology Assessment

JUL -2 1986

NOTE TO ANNA BOYD, EXECUTIVE SECRETARIAT, PHS

SUBJECT: Reuse of Hemodialysis Devices - Tracer #92625

Two additional factors need to be discussed in the subject memorandum. The PHS assessment of the risks and benefits associated with reprocessing and reuse, which is being prepared by the National Center for Health Services Research and Health Care Technology Assessment, will be transmitted to the Health Care Financing Administration on July 10.

The briefing material should note that the June 27, 1986 issue of Mortality and Morbidity Weekly Reports published by the Centers for Disease Control, contains an Epidemiologic Note on Bacteremia Associated with Reuse of Disposable Hollow-Fiber Hemodialyzers. The editorial note accompanying this Report states "Additional studies of the functional and microbiologic quality of reprocessed hemodialyzers, as well as the factors affecting their clinical safety, are needed to formulate guidelines." This view is contrary to the position taken in testimony on March 6, 1986. It is possible that staff of the Senate Special Committee on Aging will request an explanation for this discrepancy.

/s/ John E. Marshall

John E. Marshall, Ph.D.

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MMWR Article

Bacteremia Associated with Reuse of Disposable Hemodialyzers

Since May 6, 1986, the CDC and the U.S. Food and Drug Administration (FDA) have received reports from four free-standing hemodialysis clinics of clusters of patients with gram-negative bacteremia. These patients were undergoing maintenance hemodialysis at clinics in which disposable hollow-fiber hemodialyzers were reused on the same patient after disinfection with a recently introduced chemical germicide, RenNew-D (Alcide Corporation, Norwalk, Connecticut). CDC and FDA have participated in investigations of these clusters at 2 of the 4 clinics. A total of nine patients at these two clinics met an epidemiologic case definition of intradialytic bacteremia based upon the following criteria: 1) Absence of signs or symptoms of infection at the initiation of the dialysis session; 2) onset of symptoms (e.g., shaking chills, fever, hypotension, nausea, vomiting or headache) during the dialysis session which caused the dialysis session to be terminated; and 3) blood cultures obtained during or after the dialysis session grew gram-negative bacteria. All of the patients were treated with parenteral antimicrobials and reportedly recovered without evidence of sequelae. Microorganisms isolated from the patients blood included *Pseudomonas aeruginosa* (5), *Pseudomonas maltophilia* (3), *Pseudomonas cepacia* (1), *Acinetobacter calcoaceticus* (var. lwoffi) (3), *Pseudomonas putida* (1), and *Alcaligenes denitrificans* (1). Three patients had 2 or more microorganisms isolated from their blood.

Four patients reported from the other two clinics appear to meet the case definition. The four dialysis clinics had been using RenNew-D for reprocessing of disposable hemodialyzers for periods of time ranging from 6 weeks to 4 months prior to the first documented case of bacteremia.

Microbiologic investigation of hemodialyzers at one of the four dialysis clinics showed bacterial contamination of the blood compartment in 10 of 20 hemodialyzers reprocessed with RenNew-D during the week of June 9, 1986. Changes in the mixing and handling of the product were subsequently made by the staff at the dialysis clinic in consultation with representatives of the manufacturer and distributor of RenNew-D. Following these changes, cultures of saline used to rinse the reprocessed dialyzers and the extracorporeal blood circuit prior to a dialysis session, and blood cultures from a random sample of patients during a dialysis session were performed. Gram-negative bacteria were identified in 11 of 106 (10%) samples of the pre-dialysis saline rinse and in blood cultures from 10 of 75 (13%) patients. All but one of these patients was asymptomatic.

The distributor of the product (Cobe Laboratories, Inc., Lakewood, CO) has initiated a voluntary recall of all lots of RenNew-D.

Reported by Center for Devices and Radiologic Health, Food and Drug Administration, Hospital Infections Program, Center for Infectious Diseases, Centers for Disease Control.

2.

Editorial note: The practice of reusing hemodialyzers which are labeled "for single use only" has been instituted both as a means of reducing the cost of hemodialysis treatment and because of the concern for adverse reactions which may occur at the time of first use of a new dialyzer, known as "first-use syndrome" (1). There are, however, no controlled clinical studies validating the safety or assessing the risk to patients of the practice of the reuse of disposable hemodialyzers, nor are there controlled clinical studies comparing the morbidity and mortality of patients being dialyzed with new dialyzers with that of patients being dialyzed with reprocessed "single use only" dialyzers.

Bacterial contamination resulting in patient infections has previously been documented in hemodialyzers which were reprocessed with benzalkonium chloride (2,3) and 2% formaldehyde (4). To ensure the safety and efficacy of new hemodialyzers, manufacturers must meet the standards of "Good Manufacturing Practice" as regulated by the FDA. There are, however, no federal standards for ensuring the functional or microbiologic quality of "single use only" hemodialyzers reprocessed in hemodialysis clinics. Until further information is available, CDC recommends that providers of dialysis services who reuse "single use only" dialysers review their practices and experience and assess whether alternatives to one-time use of dialyzers are appropriate and optimally beneficial to patients.

3.

References

1. Hakim RM, Breillatt J, Lazarus JM, Port FK. Complement activation and hypersensitivity reactiions to dialysis membranes. N Eng J Med 1984; 311:878-82.

2. Wagnild JP, McDonald P, Craig WA, et al. Pseudomonas aeruginosa bacteremia in a dialysis unit: Relationship to reuse of coils. Am J Med 1977; 62:672-676.

3. Kuebner E, Lundh H. Outbreak of Pseudomonas cepacia bacteremia related t contaminated reused coils. Dialysis and transplantation 1976. 5:44-66.

4. Bolan G, Reingold AL, Larson LA, et al. Infections with mycobacterium chelone in patients receiving dialysis and using processed hemodialyzers. J. Infect. Dis. 1985; 152(5): 1013-19.

CENTERS FOR DISEASE CONTROL

MMWR

MORBIDITY AND MORTALITY WEEKLY REPORT

June 27, 1986 / Vol. 35 / No. 25

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418 First National Conference on Chronic Disease Prevention and Control

Epidemiologic Notes and Reports

Acanthamoeba Keratitis Associated with Contact Lenses — United States

Twenty-four patients with *Acanthamoeba* keratitis have been reported to CDC from 14 states in the last 9 months (Table 1). Although onset of illness for some patients dates to as early as 1982, most had onset of illness in 1985 or 1986. In two patients, the infected eye was enucleated; 12 patients underwent corneal transplantation.

Twenty (83%) of the patients wore contact lenses. Of these, two wore hard lenses (one hard, the other rigid gas-permeable); four wore extended-wear soft lenses; and 14 wore daily-wear soft lenses. Ten of these 20 patients cleaned their lenses with home-made saline solution prepared by mixing salt tablets with bottled, distilled, nonsterile water; four used commercially available lens-cleaning solutions followed by a tap water rinse; one used commercial bottled saline; and one cleaned lenses with tap water pumped from a private well. No lens-care information was available for four patients.

Twenty-two (90%) of the 24 patients were initially diagnosed as having corneal herpes simplex virus (HSV) infections; in the other two patients, corneal lesions were attributed to autoimmune disease. *Acanthamoeba* keratitis was diagnosed by examination of stained corneal scrapings or tissues (67%) and/or tissue indirect fluorescent antibody (IFA) test (52%) using species-specific antisera. Acanthamoebae were isolated from the corneal scrapings/biopsies of 17 (71%) of the patients. Three of the 17 patients' lens cases containing home-made saline solution were also cultured; all were positive for *Acanthamoeba*. Contact lens cases from other patients were not cultured. Patients' ages ranged from 17 years to 55 years; half were females. The right eye was affected in 13 (54%) patients and the left eye, in 11. *A. castellanii* was identified from nine (38%); *A. polyphaga*, from eight (33%); *A. rhysodes*, from four (17%); *A. culbertsoni*, from three (13%); and *A. hatchetti*, from one (4%). The species of *Acanthamoeba* was not determined for six (25%) patients. More than one species of *Acanthamoeba* was cultured from samples from four patients.

Reported by C Newton, MD, Louisville, Kentucky; WT Driebe, Jr, MD, University of Florida, Gainesville, LR Groden, MD, G Genvert, MD, JH Brenson, PhD, University of South Florida, Tampa; AD Proia, MD, GK Clintworth, MD, M Cobo, MD, D Klein, PhD, Duke University Medical Center, Durham, P Morton, MD, Raleigh, North Carolina Dept of Human Resources; T Wolf, MD, University of Oklahoma, Oklahoma City; DB Jones, MD, RL Font, MD, M Osato, PhD, Baylor College of Medicine, Houston, MC Kincaid, University Health Science Center at San Antonio, MB Moore, MD, R Silvany, University of Texas Health Science Center at Dallas, Texas; RJ Epstein, MD, LA Wilson, MD, Emory University, Atlanta, Georgia; RA Miller, MD, P Gardner, MD, RC Tripathi, MD, DF Sahm, PhD, University of Chicago, Illinois; JS Wolfson, MD, S Foster, MD, MA Waldron, Massachusetts General Hospital and Harvard University, Boston; CF Bahn, MC, Naval Hospital, Dept of the Navy, Bethesda, Maryland; G Rao, MD, FS Nolte, PhD, University of

U.S. DEPARTMENT OF HEALTH AND HUMAN SERVICES / PUBLIC HEALTH SERVICE

Please return to J. Michie

Health Promotion Awards – Continued

Health Expo '85 (Sac City, Iowa)
Planned Approach to Community Health (PATCH) (Butler County, Kansas)
Senior Citizens' Wellness Program—Growing Younger (Butler and Greenwood Counties, Kansas)
S E L F (Sharing, Exercise, Lifestyles, and Fitness)—A Model Worksite Health Promotion Program (Crescent Springs, Kentucky)
Ambulatory Diabetes Education and Follow-Up (ADEF) Program (Maine [statewide])
The Center for Health Promotion—A Rural Health Promotion Project (Lewellen, Nebraska)
Scudder Homes Health Awareness Program (Newark, New Jersey)
Columbus Satellite Health Program (Columbus, New Mexico)
Heart Health in Hamilton County Project (Hamilton County, Ohio)
Multnomah County Employee Health Promotion Program (Multnomah County, Oregon)
Healthy People Program (Allentown, Pennsylvania)
CHIP (Lycoming County Health Improvement Program) (Williamsport, Pennsylvania)
Channel 5 Health Fair (Nashville, Tennessee)
Health Enhancement Program (Nashville, Tennessee)
Health Adventure (Harris County, Houston, Texas)
Family High Risk Program (Salt Lake City, Utah)
Impedance Screening (Clarksburg, West Virginia)

PREVENTIVE HEALTH SERVICES

High Blood Pressure Control

Worksite Hypertension Program/Heart Healthy Lifestyles (Hennepin County, Minnesota)
Monmouth Hypertension Control Project (M H C P) Monmouth County, New Jersey)
Senior Volunteer Hypertension Screening and Monitoring Program (SVHSMP) (New York City

Family Planning and Pregnancy and Infant Health

Prevention of Teenage Pregnancies (Washington, D C)
Pregnant Adolescent Group for Education and Support (P A G E S) (Lake County, Illinois)
Infant Mortality Reduction Program (Bell County, Kentucky, and Claiborne County, Tennessee)
Parent Child Task Force (Richmond, Virginia)

Immunization

The Immunization Education Program at Oakwood Hospital (Dearborn, Michigan)

HEALTH PROTECTION

Accident Prevention and Injury Control

Operation Childsaver (Sarasota, Florida)
Get Caught Missoula (Missoula County, Montana)
Greeneville/Greene County Youth Alcohol Highway Safety Pilot Project (Greeneville, Tennessee)
Don't Buck The Odds Buckle Up (Dallas, Fort Worth Metroplex Area, Texas)
Operation Graduation 1985 (Salt Lake City, Utah)

Fluoridation and Dental Health

Children's Dental Disease Prevention Program (California [statewide])
Children's Dental Health Program (Red Wing, Minnesota)

Surveillance and Control of Infectious Diseases

Health Promotion in Day Care Settings (Guilford County, Greensboro, North Carolina)

Health Promotion Awards – Continued

Full descriptions of the programs are available from the respective state health agenc publication describing the Secretary's Health Promotion Awards Program and the award- 1986 will be available in July from the Center for Health Promotion and Education, CDC scriptive abstracts of all 197 projects are currently available in the computerized Comb Health Information Database on BRS Information Technologies

Reported by the Div of Health Education, Center for Health Promotion and Education, CDC

Editorial Note: The Secretary's Community Health Promotion Award was establishe 1982 to recognize exemplary local community and state efforts to improve the health of citizens In addition, explicit identification of successful community projects promotes as models for efforts in other communities. Projects aimed at risk reduction for chronic eases, injuries, infant mortality, and others are eligible and have been recognized in the Criteria for award include documentation of evaluation of impact on the selected health p lems. Interested agencies should contact the community health agencies identified regarding specific projects or the respective state health department regarding the Se tary's Community Health Promotion Award process

Reference

1 U S Department of Health and Human Services. Promoting health/preventing disease: objective the nation. Washington, D C , U S Department of Health and Human Services, 1980

Epidemiologic Notes and Reports

Bacteremia Associated with Reuse Of Disposable Hollow-Fiber Hemodialyzers

Since May 6, 1986, CDC and the U.S. Food and Drug Administration (FDA) have rece reports from four free-standing hemodialysis clinics of clusters of patients with g negative bacteremia. These patients were undergoing maintenance hemodialysis at clin which disposable hollow-fiber hemodialyzers were reused on the same patient after disi tion with a recently introduced chemical germicide, Renflow-D (manufactured by A Corporation, Norwalk, Connecticut, and solely distributed by Cobe Laboratories, Inc wood, Colorado)

CDC and FDA have participated in investigations of these clusters at two of the four cl A total of nine patients at these two clinics met a case definition of intradialytic sepsis base the following criteria: (1) absence of signs or symptoms of infection at the initiation of th alysis session; (2) presence of one or more of the following signs or symptoms during the c sis session: shaking chills, fever, hypotension, nausea, vomiting; and (3) growth of g negative microorganisms from blood cultures obtained during or following the dialysis ses Review of microbiologic records in these centers showed no clusters of gram-negative teremia during the preceding 6 months. All the patients were treated with parenteral antim

Bacteremia – Continued

bials and recovered without apparent sequelae. Microorganisms isolated from the blood cultures included *Pseudomonas aeruginosa* (five patients), *P. maltophilia* (three), *Acinetobacter calcoaceticus* (var lwoffi) (three), *P. putida* (one), and *Alcaligenes denitrificans* (one). Three patients had two or more microorganisms isolated from their blood. These two hemodialysis clinics had been using RenNew-D for reprocessing of hemodialyzers for 6 weeks and 4 months, respectively, before the first documented case of bacteremia.

Microbiologic investigation of hemodialyzers at one of the four clinics showed bacterial contamination of the blood compartment in 10 of 20 hemodialyzers after reprocessing with RenNew-D during the week of June 9. For the 17 hemodialyzers for which the number of reuses was documented, the number of previous uses ranged from one to 50. Changes in the mixing and handling of RenNew-D were subsequently made by the staff at the hemodialysis clinic after consultation with representatives of the manufacturer and distributor of the product. Following these changes, cultures were performed of: (1) RenNew-D drained from stored reprocessed hemodialyzers, (2) saline that had been used to rinse the blood circuits, including the interiors of reprocessed hemodialyzers and other components of the blood circuits, before dialysis, and (3) blood obtained from the blood circuit during the patients' dialyses. Gram-negative microorganisms were identified in none of 137 samples of RenNew-D, in seven (6%) of 108 samples of the predialysis saline rinse, and in blood cultures from 11 (11%) of 102 patients.

It has not been determined why hemodialyzers showed evidence of contamination after reprocessing with RenNew-D. The manufacturer has initiated a voluntary recall of all lots of the product. Studies are in progress to evaluate the source and possible causes of these clusters.

Reported by GT Flynn, Community Dialysis Svcs, Inglewood; SH Waterman, MD, Los Angeles County Health Dept; SB Werner, MD, California Dept of Health Svcs; TF Parker, MD, Dallas Kidney Disease Center; G Green, MD, CE Haley, MD, Dallas County Health Dept; CE Alexander, MD, State Epidemiologist, Texas Dept of Health; Center for Devices and Radiologic Health, US Food and Drug Administration; Hospital Infections Program, Center for Infectious Diseases, CDC.

Editorial Note: The practice of disinfecting and reusing hemodialyzers labeled "for single use only" has been adopted by more than 50% of hemodialysis centers responding to surveys of dialysis-associated diseases (*1*). Bacterial contamination resulting in patient infections has previously been documented in hemodialyzers that were reprocessed with benzalkonium chloride (*2,3*) and 2% formaldehyde (*4*).

Until further information is available, CDC recommends that providers of hemodialysis services review their experience and assess the clinical safety of their hemodialysis practices. Evaluation of reuse programs should include active surveillance of hemodialysis patients for both infectious and noninfectious complications. Clinical, laboratory, and epidemiologic information about patients experiencing adverse reactions should be recorded in the patient's medical record, as well as in a log book, so that incidence rates of these complications can be determined. **Additional studies of the functional and microbiologic quality of reprocessed hemodialyzers, as well as the factors affecting their clinical safety, are needed to formulate guidelines.**

References

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Notice to Readers

First National Conference on Chronic Disease Prevention and Cont

The First National Conference on Chronic Disease Prevention and Control will be September 9-11, 1986, in Atlanta, Georgia, cosponsored by the Association of State Territorial Health Officials and CDC. For information, contact the Division of Chronic Dis Control, Center for Environmental Health, CDC, telephone: commercial—(404) 452-4 FTS—236-4255.

Erratum: Vol. 35, No. 17

p. 317 In the article, "Prevention and Control of Influenza," the last part of the last (**) note of Table 1 on page 319 should read: . . . influenza vaccine recommended 1978-1979 to 1985-1986, one dose is sufficient.

DEPARTMENT OF HEALTH & HUMAN SERVICES

Public Health Service

Food and Drug Administration
Rockville MD 20857

JUL 3 1986

To Larry
Kobren
for file.

NOTE TO: The Commissioner
Through: Exec Sec ______

Frank,

In recent weeks, I've written to inform you of a problem with a particular chemical disinfectant, RenNew-D, used for reprocessing hemodialysis devices. By this note, I want to bring to your attention a new problem involving another disinfectant that we've just learned about. Over the last week or so, we received six reports (1 in DEN, 5 in MDR) of possible pyrogen-like reactions and pseudomonas bacteremia at two clinics in southern Georgia. This time, the infections were associated with Renalin, a periacetic acid-based disinfectant manufactured by Renal Systems, Inc. of Minneapolis. The two outbreaks, involving 3 patients at each facility, occurred at centers which are part of the same chain (i.e., Community Dialysis Centers) that experienced the earlier problem with RenNew-D, the disinfectant produced by Alcide Corp.

In response to these latest incidents, we issued a top priority assignment to the field last Thursday. Minneapolis district investigators visited the manufacturer the following day and again this past Monday. In a conference call yesterday, they informed us that preliminary findings by the firm indicate that the problem can be traced to faulty plumbing, which allowed excessive amounts of water to infiltrate the reprocessing system and overly dilute the disinfectant solution. Testing of product samples revealed the presence of gram-negative organisms. The firm believes that the problem is correctable and, based on their own investigation, has written to each clinic outlining their findings and recommending remedial steps. Company officials believe the problem has been resolved and plan no further action.

However, in checking company records, we discovered another incident in Fort Worth, Texas, which occurred in late May at another clinic in the Community Dialysis Centers chain. Three people treated with dialyzers that were reprocessed with Renalin were involved in that episode. Based on the Texas report (which was not filed under MDR) and the test results from the samples of Renalin used at the Georgia clinics (which were from the same lot), we plan to instruct the Atlanta and Dallas regions to conduct on-site inspections at each of the clinics to verify the company's findings. In addition to inspecting the manufacturing site, we've also advised CDC of the problem, which in turn alerted Georgia state health department officials.

In talking with CDC, we learned that staff from Senator Heinz's Aging Committee had already been in touch with them about the Renalin situation. In my earlier notes about RenNew-D, I stressed the Senator's continuing interest in the dialysis reuse issue. My intuition is that, taken together, the problems with Renalin and RenNew-D may well precipitate another round of Congressional hearings on the clinical safety of reuse.

The possibility of more hearings seems even stronger in light of a report by the Philadelphia DO indicating that the Senator's staff has been following a complaint by a dialysis patient who allegedly was denied treatment at a clinic in Philadelphia after reporting the use of reused, faulty arterial lines, which he claims resulted in blood loss and subsequent hospitalization in himself and other patients. (Note that district office staff contacted state health officials in Pennsylvania who conducted an investigation, which failed to identify any problems at the clinic in questions.) Mr. Robert Rosen, a dialysis patient advocate and head of a kidney patients group, who testified at the hearings in March, has filed a formal complaint with HCFA on behalf of the patient who made the original complaint. You should know that the issue of "patient rights" is the centerpiece of legislation just introduced by Senator Heinz, which calls for greater patient knowledge and informed consent in cases of dialysis reuse as a condition for Medicare payment.

I'll keep you informed about this latest situation as more information becomes available.

/s/ James S. Benson

James S. Benson
Deputy Director
Center for Devices and
Radiological Health

cc: Mr. Morris
Mr. Hile
Mr. Cannon
Mr. Martin
Mr. Villforth

bcc: Mr. Barnett
Mr. Gundaker/Mr. Hansel/Mr. Damaska
Dr. Skufca
Dr. Mohan/Dr. Villarroel
Mr. Arcarese/Mr. Kobren
Exec Sec

Prepared by: RCEccleston:7/1/86
Revised by: RCEccleston:7/2/86
Edited by: MBarnett:7/2/86
Cleared by: BSkufca:7/2/86 [illegible]

DEPARTMENT OF HEALTH & HUMAN SERVICES

Public Health Service

Memorandum

Date JUL 8 1986

From Director, National Center for Health Services Research
and Health Care Technology Assessment

Subject Hemodialyzer Reuse

To Assistant Secretary for Health

ISSUE

As HCFA continues to ratchet down the reimbursement rate for hemodialysis, concern has grown on the part of hemodialysis patients and the Congress, with respect to the safety and efficacy of the reuse of dialysis equipment, including bloodlines, tubing, transducer caps, and filters. Senator Heinz was sharply critical of the Public Health Service's role in this process during hearings which he conducted on March 6 of this year. The involvement of NCHSR is only recent, but NIH, FDA and CDC have had a long but non-productive involvement with these issues. During the March 6 hearing, at which I was the witness for the PHS, accompanied by John Villforth of FDA, we agreed to do an assessment of the state-of-the-art. As events have unfolded, it is clear that the March 6 testimony was not based on all of the germane facts and that we may need to take a position counter to that which we argued on March 6. We need to ascertain a PHS position and inform HCFA of that position so as to minimize embarrassment for the Department.

BACKGROUND

The March 6 hearing focused on the following issues:

1. Does adequate information exist to determine what standards are necessary for adequate disinfection of dialysis equipment?

2. How many uses of a given unit should be permitted before its integrity is compromised?

3. What is the Department doing to monitor adverse effects?

4. Are patients being fully informed of the risks attendant to dialyzer reuse and is their freedom of choice being compromised?

In 1978, the Congress directed NIH to carry out a study of hemodialysis. A contract was let which led to release of the Dean Report in 1981. The Dean Report was subsequently revised in 1982. The essential conclusion of the Dean Report was that processing, when properly effected, could yield a hollow tube filter equivalent to a new filter. Arthur D. Little, Inc. was a subcontractor to this effort and it released a criticism of the Dean report arguing that its efforts had been improperly represented and that the report was limited to an in vitro assessment which ignored clinical data.

In 1982, a departmental Interagency Task Force recommended clinical trials to address the questions identified above. That report was not sent forward from the Public Health Service to the Secretary's office. Instead, in 1983 an ESRD Coordinating Committee was established. The ESRD Coordinating Committee recommended against clinical trials on the grounds that they were not necessary and would be too expensive. They did recommend that FDA establish a registry to track events.

One of the major pursuits of Senator Heinz at the hearing was a demand that the Department undertake rigorous clinical trials. As the witness, I argued that even though there had been an increase from 15 to 65 percent of the Centers which were reusing the dialysis equipment, it was found that there had been no increase in reports of mortality or morbidity. In fact, some literature suggests that there are more untoward events with first use filters than with subsequent use filters. The apparent increase in reuse was probably stimulated by the reimbursement caps effected by HCFA. Interestingly, the price of a dialyzer unit has dropped from the $28 to $30 range to a $10 to $12 range. Reprocessing costs between $7 and $9, so at the present, the cost differential is not great.

FDA labels these devices for single use. But, it has approved reprocessing equipment. There are, however, no guidelines for the use of approved reprocessing equipment. Voluntary standards have been under development by the Association for the Advancement of Medical Instrumentation for several years, but their release continues to be delayed. In any case, they do not address the question of reuse for bloodlines, tubing, the transducer caps, or the transducer filters. Senator Heinz has argued that there should be rigorous standards which are enforced by HCFA. He faults the Public Health Service for not developing such standards. He is well aware that the buck passes from one agency to another with no one accepting responsibility for action. In part, that reflects HCFA's lack of interest in standards because it doesn't have resources for compliance monitoring and enforcement.

Senator Heinz also argues that the reprocessing of filters should be subject to the Good Manufacturing Practices Act. FDA has maintained that the reuse of the filter is a clinical matter and FDA does not regulate or monitor the practice of medicine.

FDA has approved the marketing of two disinfectants which are advertised as being less toxic than formaldehyde. One of these ReNew-D has been implicated in recent outbreaks of bacteremia in which at least one person has died. Two of these outbreaks have been in Florida. One each have occurred in Texas and California. The distributer of ReNew-D, Alcide has withdrawn it from the market.

CDC has investigated a 1983 outbreak in Louisiana in which 27 individuals were affected, 14 of whom died. CDC is investigating the current outbreaks. The question remains unanswered whether this was because of a failure of the disinfectant, or whether it was a matter of improper processing. Although I testified, based on information received from CDC, that they have a standard expressing the adequacy of the use of 4% formaldehyde solution, this is apparently not a formal standard and indeed there are no CDC guidelines for disinfection. We need to have a formal position with respect to which disinfectants are effective, at what strength can they be used, and what are the absolutely essential standards for processing.

In each of the last two issues of the MMWR, CDC has carried articles with respect to dialysis issues. In neither case was the reference to the fact that the Public Health Service was undertaking an assessment. In the first of these, MMWR addressed the issue of exposure to formaldehyde by individuals engaged in reprocessing. Concern among employees of dialysis centers over exposure to formaldehyde is thought to be one of the issues stimulating the use of alternative disinfectants. In last Friday's MMWR, CDC reported on the current outbreaks, with an editorial note calling for more clinical studies. Again, there was no reference to other PHS efforts. Both of these publications will be seized upon by Senator Heinz's staff and used to criticize us.

During my testimony, we reported that HCFA and NIH has established a registry which would make it possible to look at issues affecting reuse. Apparently that information was not correct. There has not yet been a decision as to whether or not the registry will collect information on this issue, or whether it will be analyzed for this purpose.

On June 12 of this year, HCFA participated in a briefing of the Under Secretary prior to a meeting between the Under Secretary and representatives of the dialysis patients organization. A briefing memo from HCFA to the Under Secretary is presently in clearance within the Department.

After the hearing, Dr. Macdonald directed me to carry out an assessment of dialyzer reuse. In the course of carrying out that assessment, it has become evident that communication within the Public Health Service is less than adequate. We uncovered serious omissions and inaccuracies in the testimony which had been prepared based on facts made available last March. Some of these only came to light the day before the comment period for the assessment expired, when we received several hundred pages of information from Senator Heinz. Included in that were internal PHS documents that had not previously been shared with us. On the strength of that, I requested an extension to July 10 for completing our report. However, the recent outbreaks of bacteremia, and additional information that has unfolded from that process, suggest that a report at this time might not be appropriate.

ACTION

The PHS needs to take a clinically and scientifically based stand with respect to this issue. We need to communicate that directly and emphatically to the Health Care Financing Administration, even if that means recognizing that our earlier testimony was flawed.

4540C

July 8, 1986

EIS Officer, EB, HIP, CID
Assistant Chief, EB, HIP, CID

Epidemic Aid Investigation of Bacteremias Associated with Reuse of Disposable Hemodialyzers

Director, HIP, CID
Through: Chief, EB, HIP, CID_____

We have reviewed the current status of our investigations into clusters of bacteremias associated with reuse of disposable hemodialyzers (EPIs 86-44 and 86-65) and would like to propose the following plan for pursuing this epidemic investigation.

Goals and objectives:

1) Ascertain the extent of the problem of bacteremia associated hemodialysis and specifically with reuse of disposable hemodialyzers.

2) Determine whether there are significant differences in the incidence of bacteremia, and/or other infectious complications, among patients dialyzed on reprocessed hemodialyzers disinfected with different germicides.

Approach to the investigation:

1) Literature review and review of currently available data on safety and efficacy of reuse practices. This aspect of the plan is in progress.

2) Epidemiologic investigation. We will perform case ascertainment, record review, case-control (and/or cohort studies where appropriate), and prospective surveillance for blood circuit contamination and bacteremia in a selected number of dialysis centers using different hemodialyzer reprocessing

practices (including one-time use only). Both intercenter comparisons and, we hope, intracenter comparisons could be feasibly done using the same methodology or modifications of the methodology used during the investigation of EPIs 86-44 and 86-65.

3) Laboratory Investigation. Laboratory investigation of hemodialyzers and specimens obtained during EPIs 86-44 and 86-65 is continuing. We will work with NILB personnel to develop standardized techniques for processing additional specimens which may be obtained ~~and~~ ok for determining the sources of contamination of hemodialyzers and reasons for failure of disinfection.

Plan:

1) Based on the literature review and the epidemic investigations, we will develop a protocol for performing the epidemic aid investigation of infectious complications associated with the reuse of hemodialyzers.

2) In conjunction with NILB, we will suggest some additional laboratory projects which Dr. Murphy can pursue as part of the overall laboratory investigation conducted by NILB.

Summary: It is evident that the data base concerning the safety and appropriateness of reusing disposable hemodialyzers is currently inadequate to make a scientific assessment of whether or not this practice should be promoted, tolerated, or prohibited for public health purposes. Even if the practice itself is found to be safe (or even beneficial), there is an obvious need for standards addressing the manner in which reuse is performed. Such standards must be based on clinical trials and incorporate long-term assessments of patient outcomes using a variety of measures, including morbidity and mortality. Although such studies may be outside the purview of

CDC, we can contribute our epidemiology expertise to the development of appropriate methodologies by developing model protocols to be tested in our studies of dialysis-associated bacteremia.

John J. Murphy, M.D.　　　　Steven L. Solomon, M.D.

NATIONAL KIDNEY PATIENTS ASSN.
WE HAVE MOVED
OUR NEW ADDRESS IS
SUITE 102
82 PARK LANE
FEASTERVILLE, PA 19047

July 8, 1986

The Honorable Ottis R. Bowen
Secretary of Health and Human Services
200 Independence Avenue, SW
Washington, D.C. 20201

Dear Mr. Bowen:

I have just completed my 20th draft of this letter. I am frustrated; I am concerned; I am confused. Why can't we get your department to act? Why is it that they seem to be deaf to the cries of the oppressed dialysis patient? I receive no meaningful replies from your department - not even the slightest encouragement. Can you possibly be so detached that you believe patients around the country are concocting their complaints? Not even Stephen King could create such a terror! Our system is running out of control, and the poor dialysis patient is dying as a result. How far must it go prior to your intervention?

I am enclosing an original complaint submitted by a patient member in Delaware. Its content is basically identical to those previously tendered by numerous others. Only the names are different. Why is it that you and those beneath you cannot appreciate the severity of the problem? Isn't it obvious that a patient must be at the end of his/her rope prior to gathering the courage to write a complaint? Everyone connected with the program knows that there is retaliation directed against the patient who speaks up. Some will be denied treatment and murdered. To the best of my knowledge, with the exception of Senator Heinz and his staff at the Committee on Aging, no one in the entire Federal or State governmental bureaucracy has taken any action to save a single patient? It has been easier to pass the buck. Well, you are the top - and the buck must stop somewhere!

Many months ago I submitted patient complaints directly to you. Having had no response, I again submitted those same complaints immediately subsequent to the Senate Hearings. Taking into consideration the gravity of the problem and the lives at stake, it took an unreasonable length of time for these complaints to finally have been acted upon. Unfortunately, in my opinion, without due regard, they were forwarded through channels to

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ultimately end up with the State Department of Health. What a total waste of time and effort. They handled it with the same vim and vigor as always - fully investigated the problems, never spoke to our complainants, and determined that there were no violations. What about the blatent disregard for the Federal Regulations? What about State laws on abandonment?

During that same time, a poor, maltreated, almost blind diabetic patient with one leg, Lonnie Lanier, was expelled from his unit, without notice; a shift was closed without making permanent arrangements for treatment for some of the patients; and a second patient was abandoned. After two weeks of day and night battling by Senator Heinz' office, and our Association, we could not overcome the brazen refusal of every hospital and unit in the Philadelphia area to treat Lonnie. Mr. Laniers' physician was successful in "blackballing" his patient. Finally, as a result of the threat of a restraining order, he received his life-sustaining dialysis - but only for two weeks. On July 8, 1986 when he arrived at Temple Hospital, he was met by uniformed guards who informed him that there would be no more treatments. Our State Department of Health did nothing. Network 24 did less. The Federal Government did absolutely the least. Everyone was concerned to some degree, but no one would exert any pressure to try to save Lonnie's life. He was repeatedly denied his treatments. Claudette Campbell, HHS, had the unit inspected and they were found to be in violation of the rules - having no grievance mechanism; and abandoning a patient for non-medical reasons. It ended there!

I have been informed that an infection of septicemia has broken out in California, Texas, and Florida. There is reason to believe that other States have similar problems. There is also a possibility that lives were and will be lost as a result of this problem. It was a direct result of the practice of reusing dialyzers and cleaning them without regard to the sterility of the end product, or the health of the patient. This particular crime was an aftermath of the use of the Alcide Corporation's product known as Renew D. To the best of our knowledge and information, no governmental authority had ever reviewed the quality of this product; no clinical date was required to substantiate Alcide's claims of a sterilant. Renolin is a similar untested product. Numerous others are being used as substitutes for formaldehyde. I called the people at Renolin and specifically asked if their product was approved as a sterilant. The comment was "no", but neither was formaldehyde". This should be an EPA/FDA problem. Why are they making it a patient problem? What do patients know? They are informed by their facility to submit to reuse or die! It is your obligation to administer the program to guarantee that quality treatments are rendered, that patient abuse is not permitted. This would absolutely prohibit use of untested unauthorized, unapproved, experimental treatment methods designed to permit unreasonable windfall profits at the patients' expense.

People speak of the horrors of formaldehyde. We know that a chemical whose primary use appears to be as an embalming fluid could never enhance the life of a patient receiving it three times a week intervenously. Yet, as a result of the total lack of responsibility and direction of your agency, medical practice has been permitted to sink to an all-time low. The physicians in this program and their corporate bosses have no respect whatsoever for you, your organization, the Attorney General's office or the State authorities who run this program, as was evidenced by the Lonnie Lanier matter previously discussed. Inaction by all parties has created a monster; a cancer which must be obliterated.

There are 78,000 patients being treated three times a week. How could a product like Renew D and Renolin be permitted? Why hadn't anyone looked into the matter when we continually complained over the past four years? Was it necessary to wait until sickness or death resulted in mass? Doesn't anyone read our mail? Doesn't anyone read the patient complaints? Can't anyone analyze them? Isn't it obvious that there are significant problems? Patients are beginning to panic all through the Nation. This could result in an uproar, which will be heard around the world. The government turned their back on the people - they need protection. They need quality care! THEY NEED IT TODAY! THEY NEED IT NOW!

I would appreciate an answer to my letter and questions. I also request a reply to the following:

1. When will you act on the petition submitted by Senator Heinz?

2. In the absence of governmental supervision of this program, why can't the patient at least be provided with informed consent and a choice?

In closing, I again reiterate my position that reuse of disposables is completely diametric to reason. In all products under the authority of EPA, the "label is the law" and use in a manner inconsistent is a punishable offense. Sterilants come under FIFRA and therefore, fall within the confines of that authority. Red tape and apathy have propagated an atrocity.

We humbly demand that you immediately enforce the GMP requirements upon those who re-manufacture or reuse medical disposables. We also request that inspections be immediately instituted at each and every "reuse center" or facility to guarantee that violators are decertified, and not funded.

Make no mistake, I believe that since the government pays and sets the rules, they are responsible for the lives of the patients. When they close their eyes and ears to the problem, it doesn't go away. They do not, in any way, negate their responsibility or guilt.

I am anxious for an early reply.

Very truly yours,

Perry S. Ecksel
President

PSE:pf

5/19/86

Dear Mr Bowen

I'm writing this letters in reguards to my Quality Care at Brandywine Dialysis in Wilmington. I have been on hemodialysis for quite some time and I have seen some drastic changes in my care, that has me afraid.

Here are some of the things that are happening to us. Just to give you a idea of what me and so many other patients have to go through, because we depend on a life support system.

① Having to use reuse kidneys against our will or be put out of the unit.

② Having the right to say how we would like to be dialyzed.

③ Having your doctor say to you. Because they are being cut back 11% percent, they have good reasons to cut back and corners on our lives and care.

④ Having persons that are not

professionally educated medically nor equipped to handle a life. death situation.

Mr. Bowen these are just a few things that has our little family afraid here If you or anyone in the Senate would take the time to listen or come see for yourself the pressures being forced.
We need your help. We need it now. Before all of us will be dead from the administration and doctors cutting corners with our lives.

Sincerely yours,
Miss Inez Wilcox
Lexington Green Apt.
Newark Delaware

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LIMITED DISTRIBUTION
NOT FOR PUBLICATION

PUBLIC HEALTH SERVICE-CDC-Atlanta
EPI 86-65-1 July 8, 1986

TO : Director, Centers for Disease Control

FROM : Hospital Infections Program
Center for Infectious Diseases

SUBJECT: Clusters of Bacteremia among Hemodialysis Patients—Georgia

On June 27, 1986, Steven L. Solomon, M.D., Assistant Chief, Epidemiology Branch (EB), Hospital Infections Program (HIP), Center for Infectious Diseases (CID), was called by Robert Skufca, D.O., Medical Officer, Office of Health Affairs, U.S. Food and Drug Administration (FDA), concerning a report of clusters of patient illnesses occurring at two dialysis centers. The reported illnesses, characterized by pyrogenic reactions and bacteremia, were similar to those noted in a recent investigation of intradialytic bacteremias occurring at dialysis centers which were using a recently introduced chemical germicide for disinfecting disposable hemodialyzers (see EPI-AID Memo 86-44-1). The dialysis centers reported in the present cluster had been using a different recently introduced chemical germicide for disinfecting disposable hemodialyzers. The FDA planned to conduct an investigation of the illnesses at the two dialysis centers.

Further discussions were held between Drs. Solomon and Skufca; James M. Hughes, M.D., Director, HIP; William J. Martone, M.D., Chief, EB, HIP; John J. Murphy, M.D., EIS Officer, EB, HIP; Martin S. Favero, Ph.D., Chief, Nosocomial Infections Laboratory Branch (NILB), HIP; Lee A. Bland, Sanitarian Director, NILB, HIP; Marie Reid, Nurse Consultant, Product Monitoring Branch, Office of Compliance, FDA; Robert Creasy, Supervisory Investigator, FDA; R. Keith Sikes, D.V.M., State Epidemiologist, Office of Epidemiology, Division of Public Health (DPH), Georgia Department of Human Resources (DHR); J. David Smith, Epidemiologist, Office of Epidemiology, DPH, Georgia DHR; and the regional director of the company which operates the dialysis centers. It was agreed that Dr. Murphy would join FDA officials in their investigation. Accordingly, Dr. Murphy traveled to the dialysis centers on July 8, 1986, to meet with company and FDA representatives.

C. Paul Roper, Occupational Safety and Health Region Consultant, Region IV, DHHS, was notified on July 8, 1986.

Steve Solomon
Steven L. Solomon, M.D.
Assistant Chief, Epidemiology Branch
Hospital Infections Program
Center for Infectious Diseases

James M. Hughes
James M. Hughes, M.D.
Director
Hospital Infections Program
Center for Infectious Diseases

Robert E. Windom
Assistant Secretary for Health

July 10, 1986

NOTE TO BOB RICKARD

Subject: Hemodialysis

You asked us to talk with Anna Boyd about notifying OS of the delay in the assessment of dialysis reuse. We did so, and she agreed that a "general" memo to the Secretary would be appropriate. It is attached for your clearance; then we will get clearance from John Marshall, FDA, CDC, and Steven Grossman.

Anna also asked that we do two other things:

1) Ask John Marshall if he has kept Bill Roper or Henry Desmaris informed of the progress of his study. (HCFA is proceeding with a new End Stage Renal Disease Program reg, that will reduce reimbursement rates for kidney dialysis; obviously, if that happens, dialysis centers will want to shift to even more dialysis filter reuse, since its cheaper. Therefore, if John Marshall reaches conclusions that reuse is a health hazard, it could put the HCFA folks in a quandry.

2) Anna had heard about some problems with disinfectants used in dialyzer reprocessing, and about the disagreement between NCHSR and CDC on whether more study is needed on the microbiologic quality of reprocessed filters. She asked us to call her with more information on that, for her edification.

Anne

DEPARTMENT OF HEALTH & HUMAN SERVICES

Public Health Service

Memorandum

#92760
to OS/ES
7/14

Date JUL 14 1986

From Assistant Secretary for Health

Subject Reuse of Hemodialysis Devices

To The Secretary

Through: US____
COS____
ES____

After a March 6 hearing, at which PHS and HCFA testified, Senator John Heinz wrote to you objecting to the reuse of dialysis devices by providers participating in the End Stage Renal Disease Program. The Senator expressed concern that hemodialyzers labeled for "single use only" are being improperly reprocessed and reused. He asked that the Food and Drug Administration's "Good Manufacturing Practices" regulations be imposed on such reuse (i.e., have FDA regulate the reuse of dialysis devices to assure that they are safe and effective).

Your reply to Senator Heinz explained that the Department considered dialyzer reuse to be a medical issue rather than a manufacturing question subject to GMP regulations; and that the National Center for Health Services Research (NCHSR) was conducting an assessment of the risks and benefits associated with reprocessing and use of these devices.

NCHSR's assessment is intended to determine the potential for patients to suffer adverse reactions when dialyzers are reused under existing reprocessing practices; the extent of reuse; what the costs associated with reuse are versus single use of filters; the adequacy of existing reprocessing guidelines; and ethical considerations associated with reuse. The Assessment was announced on April 10, and comments sought by June 10. Your staff asked that we submit a report to you on the study's findings by the end of June.

Several intervening factors have delayed completion of the report. On the last day of the comment period, Senator Heinz submitted a voluminous amount of new material on dialyzer reuse. Because of his interest, we wanted to include a careful review of this material. Thus, we delayed the anticipated completion date until July 10. Subsequently, there have been several outbreaks of bacteremia associated with dialyzer reuse. An examination of those outbreaks will now be included in the assessment as well.

I have directed NCHSR to develop, as part of its report, a series of recommendations for activities to be undertaken by components of the Public Health Service (FDA, NIH, and CDC). I have asked that the assessment be completed by mid-August. As soon as I have reviewed it, I shall advise you of its findings.

/s/

Robert E. Windom
Assistant Secretary for Health

23 July 86

NOTE TO BOB RICKARD

The attached draft material was sent to me for clearance by M. Patterson of your staff. I am bringing my reply to your direct attention because it relates to my 6 Mar testimony before Mr. Heinz and the subsequent events which have unfolded.

My testimony was that the NIH/HCFA registry would be used to look at dialyzer reuse. That was based on discussions at the time when the testimony was being prepared. NIH concurred with that testimony. As I indicated to Dr. Windom on 8 July, and as this draft now confirms, they are trying to back away from their earlier position. That should not be acceptable.

I hope that I will have an opportunity to clear the final on this reply as Dr. Blagg is not unfamiliar with the hemodialysis testimony.

JOHN E. MARSHALL

DRAFT

In his testimony before the Committee on Labor and Human Resources, U.S. Senate, former Acting Assistant Secretary Dr. Donald Ian Macdonald pointed out that there is limited usefulness to general registries because such registries include a variety of unique and unrelated data, and do not necessarily provide the validated, systematically collected, and comparable information required by researchers. A comprehensive, disease-specific registry of virtually an entire patient population such as the National End-Stage Renal Disease (ESRD) Patients Registry could permit tracking of patients through multiple therapies and could permit some comparisons of while the effectiveness of both kidney dialysis and transplantation. However, it must be emphasized that such comparisons would be useful, then utility might be limited because they are rarely definitive in establishing safety and efficacy of a given intervention.

Enhancements in the collection and analysis of ESRD data could be useful to physicians and health planners in addressing epidemiologic and medical issues surrounding ESRD therapy and providing additional information to help guide rational medical decisions.

As you know, the National Institute of Diabetes and Digestive and Kidney Diseases and the Health Care Financing Administration have entered into a collaborative agreement to analyze ESRD patient-specific demographic and medical information on the ESRD population for the purposes of research and for the production of profiles of ESRD patients and providers and related analyses. The agreement may will provide the foundation for the type of registry to which you refer.

NIH/NIDDK/EKCorrigan:slb:7/17/86
Official file located in NIDDK/OHRR:
DRAFT CLEARED:SINGER:FELD:STRIKER:RENAULT
CONTACT:Eileen K. Corrigan, 496-3583

NORTHWEST KIDNEY CENTER
700 BROADWAY • SEATTLE, WASHINGTON 98122 • (206) 292-2771

June 24, 1986 NKC-86-0779

Donald Ian MacDonald, M.D.
Acting Assistant Secretary for Health
716 G, Hubert H. Humphrey Bldg.
200 Independence Ave. SW
Washington, DC 20201

Dear Dr. MacDonald:

I recently received a copy of your testimony before the Committee on Labor and Human Resources of the U.S. Senate, June 11, 1986, and was somewhat surprised by what I took to be your negative comments about the usefulness of "general registries." One of the major problems with the Medicare ESRD Program over the years has been the lack of a good medical information system, in marked contrast to the situation in Europe, Canada, Australia and New Zealand. In consequence, last year a group of us, representative of the various relevant disciplines, got together and developed a position paper recommending a proposed ESRD patient registry involving both the Health Care Financing Administration and the National Institutes of Health. A copy of that position paper is enclosed.

This has been roundly endorsed by various professional societies, and in addition, the Transplantation Task Force included a recommendation for such a registry in its report. Such a registry has also been the subject of ongoing productive discussions between HCFA and NIH. A few weeks ago I testified at the hearing on the Transplant Task Force held by the House Subcommittee on Health and Environment, and I enclose a copy of that testimony too.

The concept of an ESRD registry is one which is generally supported by the whole of the end-stage renal disease community, and I believe it would be unfortunate if it were not to come to pass. As you know, there is considerable concern about the several proposed regulations affecting the ESRD program introduced by HCFA in recent weeks, and also concern about dialyzer reuse expressed by Senator Heinz's Committee on Aging. Answers about the effect of reimbursement changes or reuse on quality of care can only be obtained with an adequate data system. Research and developments in the treatment of end-stage renal disease also require such a system. Consequently, I would urge you to reexamine this issue.

If there is any further information that I can give you, please feel free to contact me.

Sincerely yours,

Christopher R. Blagg, M.D.
Executive Director

CRB:mjs
Enclosures

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ES/NIH Distr. 7/1/86 - NIDDK - Nec. Action (due 7/8) (DRAFT Language for input to OASH response)
Info cys: OMAR, ADPPE, DLA

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CONFIDENTIAL 25July86

Note to Frank Young. M.D.

Thanks for the phone call yesterday. I appreciate your help and regret the necessity for it. While there are a few words or phrases in my 8 July memo to Dr. Windom which in retrospect might better have remained not used, the summary of events and attitudes is accurate.

I am comfortable with the testimony to the extent that I do not believe there is evidence that patient safety has been seriously compromised. Neither is there evidence of widespread adverse events. The question is whether we are doing enough to continue to protect patients as dialyzer reuse becomes more frequent, as dialysis centers attempt to cut-costs, and as more centers reporocess with disinfectants other than formaldehyde in response to the concerns of patients and staff.

A list of documents currently in our files is atteched, as we discussed. The items marked in yellow are those which have only recently been brought to our attention. Not all of them involve FDA and clearly not all are significant. But some are, and they should have been shared earlier. More important are other documents which still have not been discussed with us. Chief among these are trends or preliminary results from the several State survey contracts.

I'm available to discuss any of this further at your convenience.

John E. Marshall

Assistant Secretary for Health

Reuse of Hemodialyzer Devices Labelled for "Single Use Only"

Administrator, Health Care Financing Administration

The attached technology assessment on the above subject has been completed by the National Center for Health Services Research and Health Care Technology Assessment (NCHSR/HCTA). In preparing this assessment, NCHSR/HCTA consulted with the NIH, CDC and FDA. It also reviewed the literature and considered the comments and information received as a result of a Federal Register notice published April 10, 1986. As additional information is identified or becomes available, NCHSR/HCTA will update and reevaluate its assessment as appropriate.

The findings to date indicate that when physicians and facilities exercise appropriate quality control over reprocessing of dialyzers, and adequate disinfecting, washing and rinsing of related components is practiced, patient outcomes appear to be no different in facilities that reuse dialyzers than for those facilities where single use is the normal operating mode. While there is evidence of a relationship between improper reprocessing and outbreaks of bacteremia/sepsis, these appear to represent isolated events. The absence of reported increases in the morbidity and mortality given increased practice of reuse suggests that virtually all facilities are following adequate procedures. The assessment also found variation in the reprocessing practices and concludes that the need exists for further study from which, if indicated, additional guidelines can be developed to assure optimal safety and clinical efficacy of dialysis, whether under single use or multiple use conditions.

I have requested NIH, CDC, and FDA to review the assessment's findings and report back to me on appropriate courses of action. The objective of these follow-up actions is to develop and provide information which will be helpful to dialysis facilities and patients in understanding the risks and benefits of single versus multiple use of dialyzers and related components.

/s/ Robert E. Windom

Robert E. Windom, M.D.

Attachment

Prepared by: NCHSR/J.Marshall/8-7-86 Aroperl
Revised by: OASH/J.Dickson/8-7-96
Revised by: OASH/B.Artim/8-7-86
Revised by: CDC/J.Mason/8-8-86
Revised by: OASH/B.Artim/8-8-86 (per 8-6-86 meeting with:
NIH/Renault:CDC/Hardy:FDA/Villforth;Eccleston:OCG/Riseberg)
Revised by: GC/D.Riseberg/8-1-86
Revised by: ASH/R.Windom & PHS Agency Heads/8-11-86
Revised by: GC/D.Riseberg/8-11-86
Revised by: ASH/R.Windom/8-11-86

DEPARTMENT OF HEALTH & HUMAN SERVICES Public Health Service

Memorandum

Date AUG - 6 1986

From Director, National Center for Health Services Research and Health Care Technology Assessment

Subject Hemodialyzer Reuse

To The Assistant Secretary for Health

This transmits the "Assessment of Medical Technology: Reuse of Hemodialysis Devices Labeled for Single Use Only" which was undertaken by NCHSR/HCTA at Dr. Macdonald's direction (TAB A). In completing the assessment, we relied on data provided both from CDC, NIH, and FDA, as well as from the published literature and materials received in response to our announcement in the Federal Register of April 10.

While the current information does not provide evidence that multiple use is without hazard, neither does it demonstrate sufficient grounds to abandon reuse. We have determined that there are potential hazards associated with reprocessing of dialyzers, blood lines and tubing, filter caps, and transducers; that long term effects of the disinfectant used in reprocessing need to be better understood; and that there is insufficient patient education material to assist patients in making an informed consent for dialyzer reuse. There is a need to take steps to assure that facilities choosing to reuse observe practices consistent with optimal patient safety and clinical effectiveness.

This also transmits to you, recommendations for actions which should be promptly initiated and completed by FDA, CDC, and NIH (TAB B). From our assessment of the current situation, this additional work will make it possible for the Public Health Service to meet its responsibility to the Health Care Financing Administration for providing scientific and clinical advice to the Medicare program.

Our normal procedure with assessments is to have the final document receive clearance from PHS agencies which have been involved in its preparation. Because of both the time frame in which this assessment was completed, and its sensitivity, I have not secured those clearances. Rather, I have prepared transmittal letters for you to send to the three relevant agencies (TAB C). These include instructions for the Commissioner of FDA, and Directors of CDC and NIH to respond directly to you. These transmittals direct them to initiate the activities for which they will be responsible, and to comment on our findings.

It is incumbent on the Public Health Service to identify and to publicize the optimum practices for assuring safety and quality. It is our further responsibility to provide advice to HCFA, but ultimate responsibility for the End-Stage Renal Disease program lies with that agency.

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Attachments

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PUBLIC HEALTH SERVICE ASSESSMENT
THE REUSE OF HEMODIALYSIS DEVICES
LABELED FOR "SINGLE USE ONLY"

1986

INTRODUCTION

Reuse or multiple use of hemodialysis devices, labeled by the manufacturers for single use only, is the practice by which dialyzers and in some instances blood lines, transducer filters and dialyzer caps are reprocessed and used for more than one dialysis treatment. The practice of dialyzer reuse occurs when a dialyzer, after its original use, is reprocessed, stored, and then used again on the same patient, often multiple times (1). The reprocessing generally begins with an initial rinsing of the dialyzer after dialysis. The dialyzer is subsequently cleaned, disinfected and prepared for subsequent use, which includes disinfectant rinsing. The actual reprocessing procedure and the number of reuses tend to vary among facilities (1).

The multiple use of hemodialyzers has been practiced since the earliest phase of periodic hemodialysis treatment for chronic renal failure. It is intended that patients participating in reuse programs are exposed to only those dialyzers which they, themselves, have previously used. While the practice of reusing dialyzers has, in the past, been limited to a few dialysis centers, the reuse of dialyzers today has rapidly increased, mostly due to economic considerations. Since the dialyzer is substantially the most expensive disposable of the dialysis procedure, its reprocessing and reapplication for the same patient can produce considerable per-dialysis cost reduction (2). At the present time it has been estimated that more than 60 percent of the dialysis procedures performed in the U.S. are performed with reused dialyzers. The extent of reuse of blood lines, transducer filters and dialyzer caps is not well documented.

Despite the extensive practice of dialyzer reuse its safety and efficacy is a subject of some controversy. Water, aqueous and nonaqueous chemical solutions are utilized for rinsing, cleaning, and disinfecting the dialyzer prior to each use. Presently, there are no existing standardized guidelines for performing these procedures, although various medical and industry groups are developing guidelines. Also, the majority of reused dialyzers are disinfected with formaldehyde. Although the formaldehyde solution is throughly rinsed from the hemodialyzer before the initiation of the dialysis treatment, trace amounts of formaldehyde (and its reaction products) are present in the dialyzer, and may enter the patient's blood.

The multiple use of dialyzers requires that the function of the dialyzer be effectively preserved by the reprocessing procedure. The efficiency of modern dialyzers when they are subjected to multiple use, and the optimum number of times a dialyzer can be reused without loss of clearance capacity has not been well studied (3). Because of the chronic nature of dialysis therapy and its intended use as a mass transfer device, there is a concern about the potential long-term adverse effects of dialyzer reuse. Long-term effects can be subtle and clinical symptoms may not be evident until many years into a patient's reuse program (4). While there are some reports in the literature that document the adverse effects of reuse (5,6), most indicate that dialyzer reuse is a safe and effective practice with minimal patient complications (7,8). Published studies of hemodialysis treatment employing reprocessed dialyzers report equivalent mortality compared to treatment with a first use (new) dialyzer (9,10).

There are those, however, who question whether there is sufficient assurance that reused dialyzers conform to the same quality standards of safety and efficacy as new devices, including those standards for sterility, function, and patient safety. These same persons question the medical appropriateness and safety of reuse as it is presently practiced. Moreover, they insist that patients be informed of the potential long-term risks and/or benefits associated with reuse and be allowed freedom of choice.

BACKGROUND

Patients with chronic renal failure have been treated by hemodialysis for over two decades. It is the most widely used method for removal of the solutes that accumulate in the blood and tissue following renal failure. In hemodialysis, blood is pumped from the patient's body, subjected to a process of dialysis, and then returned to the body in a continuous extracorporeal blood loop. Dialysis occurs as the blood is passed through a hemodialyzer, or artificial kidney. In the hemodialyzer (dialyzer) blood and dialysate are separated from each other by a semipermeable membrane (11). In patients with renal failure, the blood contains accumulated waste products (solutes) and abnormal levels of electrolytes. The dialysate, on the other hand, is free of waste products and contains desirable concentrations of physiological chemicals. Solutes are transported through the membrane to the dialysate by diffusion from the blood and by convection, the entrainment of solutes with water as it flows through the membrane. Convection is limited by the relatively low water permeability of the membranes commonly used. Also, because diffusion is greatly dependent on the size of the molecule and of the pore through which it must pass, dialysis does not remove larger molecules (middle molecules) efficiently. Furthermore, by regulating pressure on either side of the membrane, buildup of excess body fluids can be effectively removed through the blood to the dialysate (11).

Dialyzers consist essentially of three basic parts: a compartment for the blood, a compartment for the dialysate, and a semipermeable membrane separating the two. The three principal types of dialyzers—parallel plate, coil, and hollow fiber—differ essentially in how these basic parts are arranged (1). All three types of dialyzers are generally described by manufacturers as "single-use disposables," but in fact are often reused. The Kiil dialyzer, a type of plate dialyzer, is specifically designed for reuse but its inconvenience has made its popularity quite limited.

Dialysis can be performed at home or in hospital-based or freestanding dialysis facilities or centers. Patients are usually dialyzed 3 times per week, and each treatment takes about 3 1/2 to 5 hours. Approximately 80,000 end-stage renal disease (ESRD) patients were treated in 1985 in the U.S. with hemodialysis (Personal Communication).

In 1964 Shaldon initiated the concept of using a disposable dialyzer more than once when he reported a technique for reuse involving refrigeration of the coil dialyzer (12). The incentives to reuse was the rationing of medical supplies. The goal was to reduce the cost of purchasing coil dialyzers. A technique for reuse of the Kiil dialyzer, aimed at eliminating the need for disassembly and rebuilding, was described in 1967 (13). Patients performing hemodialysis at home using a Kiil dialyzer had to spend a considerable amount of time rebuilding and sterilizing the dialyzer between each treatment. Reuse was a technique which reduced the cost and also the frequency of rebuilding the Kiil dialyzer. Modifications and improvements of these early techniques soon followed. Subsequently, reuse procedures were reported for other types of dialyzers. The development and publication of these procedures paralleled the introduction of new types of dialyzers such as the hollow fiber dialyzer, in the dialysis community and with its numerous variations in rinsing, cleaning, and disinfection.

Today, the hollow fiber dialyzer is widely used. (14). They are considered to have excellent dialysis performance characteristics because they are small, efficient, and relatively easy to use. Also, although all three types of dialyzers can be reused, the hollow fiber dialyzer has come to be regarded as especially suitable for reuse. In practicing reuse it is important to monitor the changing performance characteristics of the dialyzer as it is reprocessed. It appears that hollow fiber dialyzer characteristics allow for a relatively straightforward indirect determination of the reused dialyzer's efficiency. Gotch demonstrated that a hollow fiber dialyzer's ability to perform its clearance function is directly related to the hollow-fiber cell volume, which can be easily and readily measured on-line (15,16). For these reasons and the fact that it is considered rugged and able to withstand the reprocessing treatments, the hollow fiber dialyzer continues to be favored for the hemodialysis procedure.

With the advent of presterilized disposable dialyzers, time saving ceased to be a factor, but the cost of the dialyzer continued to be important, especially before the institution of the Medicare ESRD program in 1973 (4). During the early 1970s, hemodialysis therapy which had vastly improved, rapidly expanded in the United States, partly due to government funding via the Medicare ESRD program. With the rapid growth of kidney dialysis therapy and the establishment of a fixed rate reimbursement structure, cost considerations became a sufficient incentive to practice reuse. Reuse activity began to rise to a significant level (4). In 1978 it was estimated that 16 percent of the dialysis centers in the U.S. practiced reuse (17).

In the early 1980s the development of automated reprocessing machines significantly influenced the growth of the practice of dialyzer reuse. Beginning in 1981, a number of automated dialyzer reprocessing machines were being marketed under Section 510 (k) of the Medical Device Amendments to the Food and Drug and Cosmetic Act as are hemodialyzer filters. A year after the introduction of the automated reprocessing machines, reuse activity increased from about 27 percent of the dialysis centers practicing to approximately 40 percent (4). Over 60 percent of dialysis centers are now practicing reuse (4). To what extent these facilities are using automated dialyzer reprocessing machines is not well documented. Responses to a 1984 survey of dialyzer reuse by the Renal Physicians Association indicated that about 40 percent of their respondents (50 percent of those surveyed) used automated reprocessing methods (about 125 facilities) (Written Communication).

The growth in the practice of dialyzer reuse has also been influenced by the favorable results of published research studies and the positive findings of a number of conferences regarding the multiple use of hemodialyzers. Nephrologists have been persuaded by data of Deane (18), Gotch (16), Kant (19) and others that reprocessed hemodialyzers maintain states of cleanliness, function and sterility (high-level disinfection) which is equivalent to the first-use dialyzer. They have reviewed and cited morbidity and mortality studies such as those reported by Wing (9), and Pollak (10) which suggest that the mortality of dialysis patients is the same or less in patients using reprocessed dialyzers than in those using only new dialyzers (9,10). They are also convinced by the evidence of Gotch and Keen (20), Lewis (21), and others that multiple dialyzer use can be safely accomplished if the formaldehyde is thoroughly purged from the reprocessed dialyzer and effectively absent (less than 3-5 ppm) before its reuse. Recent reports by Hakim (22), Hakim and Lowrie (23), Robson (24) and others that dialyzer reuse improves the biocompatibility of the dialysis process and reduces the incidence of first-use syndrome has further encouraged nephrologists to practice reuse.

This report examines these and other published studies as well as other available evidence that pertains to the safety and clinical effectiveness of the reuse of hemodialysis devices.

RATIONALE

Proponents of dialyzer reuse argue that hemodialyzer reuse is now standard practice in dialysis facilities throughout the United States. They see hemodialyzer reuse as a proven technique posing no meaningful risk, and providing certain important benefits to patients. They cite some published research which suggests that dialysis with properly reprocessed dialyzers preserves effective urea, creatinine and ultrafiltration clearance for multiple uses (7). Proponents claim that the retrospective epidemiologic studies, despite their limitations, suggest that the mortality of dialysis patients is the same or less in patients using reprocessed dialyzers compared to those using only new dialyzers. Based on several recent studies, they believe that infection rates are no different in patients reusing dialyzers and that dialyzer reuse actually improves the biocompatibility of the dialyzer process. Both neutropenia and complement activation are attenuated with reuse. Proponents recommend that in those facilities where dialyzer reuse is prescribed, rigorous procedures for assuring the safety and efficacy of used dialyzers must be practiced and documented.

DISCUSSION OF THE ISSUES

Morbidity and Mortality

As early as 1978, there were reports on studies of the safety, efficacy and function of reprocessed dialyzers. In general, these and later studies revealed that dialyzer reuse seemed a safe and effective practice with minimal patient complications (25). Published studies of hemodialysis treatment employing reprocessed dialyzers have reported equivalent or improved clinical results as compared to treatment with a first use (new) dialyzer, including no adverse effects on patient survival. In 1978 when home dialysis survival in Europe was 55 percent at 10 years and equaled living-donor transplant patient survival, most of the home programs were associated with reuse (26). Wing and associates reported the mortality of patients practicing reuse was shown to be less than patients not practicing reuse in a study by the European Dialysis and Transplant Association (9). From a 1976 survey of renal units in the United Kingdom (UK) and five European countries Wing found that mortality in the UK after the first 12 months' treatment in the patients who regularly reused disposable dialyzers was lower in both home and hospital groups than in those who did not reuse. Moreover, these findings were similar to the findings from an analysis of results in five European countries where a high proportion of patients regularly reused disposable dialyzers. While there was no comparison of the incidence of morbidity, Wing reported that of the 33 units which reused, 13 observed pyrexial reactions and three episodes of bacteremia due to reuse. Although the morbidity was considered appreciable, it was believed that good reprocessing techniques could minimize morbidity due to reuse. Although limited as a retrospective epidemiologic study and while the mix of patients in each group was not controlled for baseline medical risk, the data are still suggestive of the potential benefits of reuse.

In addition to the study by Wing, Kant and Pollak reported in 1981 that multiple dialyzer use over a 15 month period was not associated with an increased rate of morbidity or mortality (19). From a group of 104 patients they compared the rate of hospitalization of 27 patients occurring during a 15-month reuse period with that of the same patients during a comparable earlier period in a unit not reusing dialyzers. The authors found that the rate of hospitalization for all causes was not greater when the 27 patients were dialyzed in the unit practicing multiple use as compared with the rates in the unit practicing single use. Moreover, days of hospitalization for dialysis-related complications were almost twice as great in the facility practicing single use as compared to the facility practicing multiple use. Mortality during the study period was about 11.3 percent per year which the authors felt compared favorably with reported mortality in stable patients under 60 years of age without diabetes that dialyzed in units not reusing. A survey by Mathews and coworkers of all Australian dialysis centers found the 1-year patient cummulative survival for units with a reuse policy was about 93 percent and those with a single use policy about 87 percent (27). The units reusing tended to be larger (mean number of patients 31/unit) compared to single use units (14/unit).

Recently, results from a life table analysis that covered an eleven-year experience (1971-1982) for 276 patients, who have reused since 1972, has been presented (28). According to the analysis the one-year survival rate is 96 percent, the five-year rate is 58 percent and the ten-year rate 26 percent. According to Foxen, the findings suggest that the survival rates of patients that reuse dialyzers are similar to the survival rates of patients who do not reuse.

In 1986, there is additional data, consistent with the earlier findings, that suggest that treatment by hemodialysis with dialyzers that have been reprocessed and reused multiple times (average of 6 times) is not associated with an increase in morbidity or mortality (10). From a study comparing the outcomes of patients treated for one to seven years at two facilities practicing multiple reuse to the outcomes in patients treated elsewhere, Pollak and associates recently concluded that there were no adverse long-term effects of multiple use of dialyzers (10). They analyzed data from 259 and 1,059 successive patients at the two facilities practicing reuse, followed respectively for 535 and 2,209 patient years. According to the authors hospital admissions (1.63 and 2.19/year) and days in the hospital (14.24 and 22.71/year), measures of morbidity, compared favorably to those reported by other investigators for patients treated by all modes of dialysis. Pollak found the case fatality rate for one facility was less (11.3 percent) and for the other equal (15.7 percent) to the national unadjusted dialysis case fatality rate (15.1 percent) for all patients treated by all modes of dialysis during 1980-1983. Most deaths at the two facilities practicing multiple use of dialyzers were due to proven or presumed myocardial infarction, cardiac arrhythmia, hyperkalemia, or infection. These causes of death are similar to those reported by other investigators for patients treated by all modes of dialysis (10).

Because repeated exposure to formaldehyde has been considered a possible risk factor for cancer, the authors also reviewed patient data for the presence of malignant tumors. In 1,009 patients twenty-nine tumors, including new metastases, developed since hemodialysis treatment with reuse started. This was equivalent to one new tumor per 68 patient years on dialysis. According to Pollak all these findings are consistent with the view that treatment by hemodialysis with dialyzers that have been reprocessed and reused multiple times is not associated with an increase in morbidity or mortality. However, Pollak emphasizes that good patient outcomes can only be expected when there are strict standards for quality methods of reprocessing dialyzers.

Since 1977 the annual mortality rate (about 19 percent) for all patients on hemodialysis has been fairly constant despite the four-fold increase in the number of patients practicing reuse. Mortality rates usually range from 7 percent for persons under 35 years of age to 33 percent for those over 65, and from 8 percent for patients whose renal failure was due to polycystic disease to 28 percent for patients in whom it was due to diabetes (29). There has been no noticeable effect of reuse on patient survival in any of these groups. Taking a closer look at this issue, Held and associates at the Urban Institute retrospectively analyzed the survival experience of a sample of 4,801 males with chronic renal failure whose first dialysis occurred in 1977 (30). Held determined the relative risk of death for those patients treated in dialysis units that had been reusing dialyzers for a long time compared to those patients treated in units that had never reused dialyzers. Their data suggested that reuse had no difference or possibly a negative effect on mortality.

While the results presented above, from 1978 to 1986, are by no means conclusive, they do suggest that the long-term effects of reuse may not be detrimental to patients' health. Regardless, large scale controlled clinical trials are still considered necessary by a few investigators to determine the subtle, long-term effects of reuse, the feasibility of such trials has yet to be determined. The concern for potential long-term adverse effects results primarily from the trace amounts of formaldehyde disinfectant which are present in the dialyzer after rinsing and may enter the patient's blood.

Formaldehyde

Toxicity: Formaldehyde is used as a chemical germicide to control bacterial contamination in water distribution systems and in the dialysis fluid pathways of artificial kidney machines. Moreover, formaldehyde is the most commonly used disinfectant for reprocessing hemodialyzers. It is used in concentrations ranging from 1.5 to 6 percent, with 2-4 percent the most common concentrations used. Because of the potential for formaldehyde carcinogenesis and anti-N-like antibody (ANAb) formation there are both concerns and controversy regarding safe residual formaldehyde levels in the dialyzer (20). Recommendations in the literature for safe formaldehyde concentrations in the final rinse solution range from 2 ppm (Lewis) to 10 ppm (Koch) and the state of California has proposed less than 1 ppm (21,31).

A vast amount of literature documents occupational hazards attributable to formaldehyde. The many adverse effects of formaldehyde exposure include injury to the eyes, olfactory system, respiratory tract, skin, central nervous system, alimentary canal, reproductive system, and blood (32). Acute effects range from irritation of the respiratory system, eyes, and skin to chronic laryngitis, bronchitis, pneumonia, conjunctivitis, and ulcerations (32). Formaldehyde has also been shown to cause cancer in laboratory animals (33). Although controversy still exists over this matter, the National Institute for Occupational Safety and Health has classified formaldehyde as a potential carcinogen (34). It is argued that the action of formaldehyde as a local irritant could be responsible for the nasal squamous metaplasia and squamous carcinomas in these laboratory animals and that similar effects from formaldehyde administered parenterally in very small amounts are unlikely (20). According to Gotch and Keen the cumulative formaldehyde dose required to produce nasal cancer in rats when extrapolated to humans would be 575 mg/wk for 12 months or a total of 1500 mg formaldehyde (20). They determined that it would require 35 years of dialysis to reach this level of cumulative exposure with a final rinse of 10 ppm formaldehyde and 64 years if the final rinse equals 1 ppm. The authors note that no evidence exists to suggest that very low dose exposure to this substance in the blood causes similar effects in humans.

Formaldehyde is present at physiologic levels in human blood as a result of metabolism and the breakdown of fat and other substances. Also, formaldehyde levels considerably above the residuals in the reused dialyzer occur as an active metabolite when methenamine mandelate is used as a bacteriostatic agent for urinary tract infections. Formaldehyde levels of 1500 mg in the stomach and 100-200 ppm in the bladder have been calculated. Gotch and Keen concluded that in comparison to the level of formaldehyde required to produce cancer experimentally and the doses resulting from therapeutics in medicine, the small residual levels in dialyzers with a final rinse of formaldehyde of less than 10 ppm would appear to pose a truly negligible risk for carcinogenesis (20).

Chromosomal damage in dialysis patients using reused dialyzers disinfected with formaldehyde has been observed by Goh and Cestero (35). These workers examined 1187 metaphase specimens of cells that they obtained directly from the bone marrow of 40 dialysis patients. The investigators found a marked increase in chromosomal abnormalities including aneuploides, breaks, and structural changes. These effects were observed in patients receiving 126 ± 50 mg of formaldehyde during each treatment, which seems quite high compared to the 13 mg reported by Lewis (36). Also, the study did not include a group of similar dialysis patients without exposure to formaldehyde as a control group. However, in light of these findings and the findings of Goldmacher and Thilly that formaldehyde is mutagenic to human cells that are cultured in vitro additional research is warranted (37).

For the dialysis patient, formaldehyde acute toxic reactions have been described and include localized burning, numbness of the lips and tongue, burning extremities, hypotension and difficulty in breathing (38). According to investigators the formaldehyde exposure responsible for these types of reactions were large (compared to exposure concentrations of less than 10 ppm) and probably due to inadequate removal (rinsing) of the formaldehyde and insensitive testing for its presence, although, some patients are sensitive to formaldehyde at any level. Primarily because of its convenience, the

Clinitest has been commonly used to measure residual formaldehyde in dialyzers to which patients would be exposed. According to Beall, this did little to protect patients from exposure to formaldehyde because the lowest concentration that it can accurately measure may exceed 50 ppm (38). Koch has reported negative detection for the presence of formaldehyde with the Clinitest tablet test, even in cases where the formaldehyde concentration exceeded 100 ppm in the dialyzer effluent (31).

Anti-N Like Antibodies: Formaldehyde at concentrations too low to cause immediate symptoms has also been associated with the production of anti-N-like antibodies in patients reusing dialyzers. In 1972, Howell and Perkins described a specific cold agglutinin reacting with red cells bearing the antigen N of the MN-blood-group-system in patients on regular hemodialysis treatment (39). The authors called the antibody "anti-N-like" and discussed the possibility that reuse of the dialyzer and its disinfection with formaldehyde may result in the formation of antibodies cross-reacting with altered red cell membranes. Subsequently, several investigators confirmed that the incidence of ANAb was related to the use of formaldehyde as a dialyzer disinfectant (40,41). According to Kaehny and associates a reaction between formaldehyde and a portion of the red cell MN structure is responsible for the generation of a foreign antigen which stimulates ANAb formation (40). Residual levels of formaldehyde in the bloodstream could alter the red cell membrane sufficiently to render it immunogenic. Also, the disinfection procedure during reprocessing provides the opportunity for prolonged exposure of red cells (trapped in the dialyzer) to formaldehyde during the 36-40 hours of disinfection and storage prior to the next dialysis. Subsequent hemodialysis may then wash some of the altered antigens into the circulating blood for delivery into the patient. When these substances are sufficiently antigenic and the patient's immune system competent, Kaehny believes ANAb's will be formed (40).

Little is known about possible clinical implications of ANAbs. According to Kaehny, the presence of this antibody in dialysis patients is usually not manifested clinically. In his series of patients there was no evidence of hemolysis, increased transfusion needs, or anemia disproportionate to that seen in patients without ANAb (40). However, because altered membrane characteristics do occur and ANAb's are generated, Kaehny recommended consideration of discontinuance of dialyzer reuse or the adoption of a non-formaldehyde process for disinfecting dialyzers.

In other studies, ANAb formation has been associated with the extent of renal anemia in some dialysis patients and acute graft failure in others (39,42). Howell and Perkins reported two instances in which red cell agglutination resulted in obstruction and subsequent failure of grafts which were implanted without rewarming in type N patients with ANAb's (39). The presence of ANAb's may become significant at the time of renal transplantation if the donor kidney has been chilled to a temperature at or below that at which the antibody can agglutinate the patient's own red cells. According to Howell and Perkins in each case a second kidney functioned well after being infused with warm saline before implantation (39). Fassbinder and Koch recommended that dialysis patients using formaldehyde as the disinfectant be investigated for the occurrence of ANAb's, especially if they are candidates for renal transplantation (43). Lewis and colleagues found no evidence that the presence of ANAb's influenced the outcome of renal transplantation in their patients, even though no special precautions were taken to warm the kidney before transplantation (21).

Work by Fassbinder and coworkers in 1979, demonstrated an association between the presence of ANAb's with the development of anemia in some patients who dialyzed with formaldehyde disinfected dialyzers (42). Fassbinder found red cell survival significantly reduced in 16 patients with anti-N-like positive sera, when compared with 19 antibody negative control patients. Moreover, replacement of the formaldehyde disinfected dialyzers with ethylene-oxide sterilized disposable dialyzers resulted in a significant increase in the red cell half-life of antibody positive patients. In antibody negative patients red cell half-life did not increase when disinfection with formaldehyde was avoided. The authors also reported a significant rise in the mean hematocrit of antibody positive patients avoiding formaldehyde exposure for 8 to 11 months (42). The findings of Fassbinder suggest that the presence of ANAb's in hemodialysis patients using formaldehyde disinfected dialyzers is accompanied by increased hemolysis, and that this increased hemolysis may contribute to the degree of anemia of these patients (42).

In 1979 Sandler and associates reported that the results of their studies supported the earlier findings that the use of formaldehyde-disinfected dialyzers is causally related to the formation of ANAb's in hemodialysis patients (44). Their study also showed that the agglutination of formaldehyde treated red blood cells by sera from patients treated with formaldehyde-disinfected dialyzers was not dependent on the presence of ANAb's. The authors concluded that the hemagglutination reactions of hemodialysis patients' sera and formaldehyde-treated red blood cells in the absence of ANAb's indicates the presence of another formaldehyde-related antibody in hemodialysis patients. They designated this formaldehyde-related antibody "anti-formaldehyde." In the recent study by Mathew and coworkers on the multiple use of dialyzers in Australia 6 of 42 patients were identified as having this anti-formaldehyde antibody (27). Mathews recommended monitoring the reuse program to detect the presence of these antibodies. Although an increased incidence of anti-nuclear antibodies has also been observed in dialysis populations, Shaldon and others found no difference in incidence between the reuse group and other groups (26). According to Shaldon, reuse (formaldehyde exposure) was not responsible for this phenomenon.

Residual Levels: At the present time because the only established parenteral toxicity of formaldehyde in humans is ANAb formation the recommendations for safe residual concentrations of formaldehyde in the dialyzer have been based on its presence. Early *in vitro* studies by Fassbinder and coworkers demonstrated that the alteration of the red cell membrane by formaldehyde was dose dependent (41). More recently, Fassbinder and Koch have reported that the minimal formaldehyde concentration capable of inducing an effect (red cell agglutination) in vitro was 10 ppm (43). According to Shaldon this could explain why only 30 percent of patients who dialyze with formaldehyde disinfected dialyzers develop ANAb's (26). Fassbinder and Koch suggested that the prevention of ANAb formation could be achieved not only by total avoidance of formaldehyde as a disinfectant but also by reducing the formaldehyde concentration in the blood and dialysate compartment at the start of dialysis to values below 10 ppm (43). However, the occurrence of ANAb's in 6 percent of the patient population screened in Pollak's study raises questions since these patients were supposedly exposed to formaldehyde concentrations of less than 0.5 ppm (10). From the Australian survey, Mathew found that the occurrence of ANAb's increases as the reuse program continues (27). After a year and a half of reuse the incidence of ANAb's was nearly 10 percent (4 of 42 patients). Residual formaldehyde levels were not provided.

Numerous discussions regarding safe levels of formaldehyde residue have cited the studies of Lewis and coworkers (21) and Koch and associates (31). Lewis reported a 30 percent incidence of ANAb's in patients with mean final dialyzer rinse of 8 ppm formaldehyde, range 3-13 ppm (21). Koch found a similar incidence of ANAb's with a much higher mean dialyzer rinse of 70 ppm, range 3 to 1,080 ppm (31). In 53 percent of the cases the formaldehyde concentration was less than 10 ppm. In 14 percent of the cases it exceeded 100 ppm. Lewis reported zero incidence of ANAb's with formaldehyde centrations of 0.5 to 1 ppm and Koch found ANAb's disappeared when formaldehyde reuse was eliminated. Also, in the in vitro studies of Orringer and Mattern alterations of the red cell ATP (a measure of red cell injury) became substantial at formaldehyde concentrations of 3.0 ppm or above (45). According to Gotch both the maximum and mean formaldehyde doses infused during dialysis vary minimally over a formaldehyde range of 1-10 ppm (46). He also noted that the maximum daily dose of formaldehyde (10 ppm) due to dialysis is less than the California Occupational Safety and Health Agency daily limit of 19 mg/day by inhalation (based on a five day exposure). Gotch suggests that based on these data the safe level of formaldehyde residue is less than 5 ppm (46). Some of the organizations that have recommended guidelines for the reuse of hemodializers have adopted the 5 ppm level for formaldehyde residue. These organizations include the National Kidney Foundation and the Association for the Advancement of Medical Instrumentation (AAMI) (47,48).

According to the AAMI subcommittee the recommendation for a maximum residual level of formaldehyde of 5 ppm in the AAMI proposed recommended practice for reuse of hemodializers was based on: "(1) Anti-N-like antibody formation, the only established chronic toxicity due to formaldehyde in reused dialyzer, which does not occur below a residual formaldehyde level of 10 ppm; (2) The maximum daily dose of formaldehyde due to dialysis is less than the California Occupational Safety and Health Agency daily limit, which is based on a 5 day week, while dialysis patients usually dialyze 3 or fewer times a week (Gotch, 1984); (3) There is no evidence of toxicity due to the long-term use of methenamine by mouth for urinary tract infections at doses that release considerably more formaldehyde to the patient than occurs from reused dialyzers; and (4) Lower residual formaldehyde levels than 5 ppm are difficult to monitor and considerably increase the time required to prepare the dialyzer for dialysis (48)."

The State of California Department of Health Services has recommended a formaldehyde residual level of less than 1 ppm in its proposed regulations regarding hemodialyzer filters (49). In the absence of concrete evidence to support a safe level of formaldehyde dialyzer disinfectant the State of California views any residual formaldehyde level as undesirable and potentially hazardous to the health of the dialysis patient (49).

Rinsing: While it is desirable to expose the dialysis patient practicing reuse to the lowest residual formaldehyde concentrations possible, it is also desirable to use a sufficient concentration of formaldehyde or other disinfectant to achieve satisfactory bacteriocidal effectiveness (see section on infections). Rinsing is the step in the reprocessing procedure that is responsible for adequate removal of the disinfectant prior to reuse. According to many investigators it is very difficult to rinse a hollow-fiber dialyzer with a cellulose membrane (used more than 95 percent of the time) completely free of formaldehyde or other disinfectants (36,46). According to Fassbinder and Koch, despite reportedly effective methods to reduce formaldehyde concentration in stored dialyzers, formaldehyde residuals can still be present in dialyzers, even after rinsing with large volumes of water or saline (43). Shaldon reported increasing the rinse volume of reused dialyzers to 7 liters to reduce the concentration of formaldehyde in the effluent at the time of hook up to less than 10 ppm (26). Because of the undesirable concentrations of formaldehyde in dialyzers at the start of dialysis, Lewis and coworkers investigated the effect of different methods of rinsing on residual formaldehyde levels (36).

Lewis reported that two modifications produced a substantial reduction in the formaldehyde concentration in effluent saline. One modification required discarding the saline in the dialyzer after connecting the arterial line. While this modification reduced the concentration of formaldehyde to which the patients were exposed, the greatest reduction in formaldehyde concentration was achieved with a modification that retained 500 ml of the priming saline to wash through the blood compartment just before connection of the venous line to the patient. Lewis reported that the concentration of formaldehyde infused into the patient fell below 2 ppm with this modification (36). Discarding the displaced priming volume (saline or dialysate) prior to dialysis removes the formaldehyde that diffuses back (rebound effect) into the blood compartment while the blood lines are clamped off and the patient prepares himself and inserts his needles. The California proposed regulations for reprocessing and reuse of dialyzers requires purging the priming volume prior to dialysis treatment to account for the rebound effect and formaldehyde buildup (49). The authors of the California proposed regulations believe that the less than one ppm standard for formaldehyde will also require more rinsing time (than is usually practiced) per dialyzer, which they estimate to be from 20 to 30 minutes (49). The AAMI proposed recommendations suggest repeating the priming and elution process after a delay between rinsing and start of treatment. Because this delay is known to result in concentrations of disinfectant above the recommended level due to rebound (48).

While the chemical sink (formaldehyde diffusion into the gel layer) of the dialyzer is the controlling factor determining rinsing time, other factors include the initial concentration of formaldehyde used for disinfection and the final rinse concentration desired. According to Gotch, rinsing time increases sharply as the targeted final rinse concentration falls below 5 to 10 ppm (46). He found that at a final concentration of 10 ppm, rinse time is approximately 5 minutes, while at 1 ppm rinse time increases from 20 to 25 minutes, and this is for dialyzers stored in only 1.5 percent formaldehyde. Because adequate rinsing (achieves desired residual formaldehyde concentration) with large amounts of sterile flushing fluids may result in a time-consuming and costly process, attempts have been made to reduce the rinsing volume and time by reducing the percent formaldehyde used for disinfection. These methods will be discussed in the section addressing infections.

Monitoring: Sensitive monitoring of residual formaldehyde concentrations (or other disinfectants) is necessary in order to ensure effective removal (rinsing) of the disinfectant. Moreover, it will ensure that patients are not exposed to formaldehyde levels greater than those recommended. Verification of adequate removal of dialyzer disinfectant by a suitably sensitive test prior to the use of each dialyzer can be found in most reuse guidelines (47,48,49).

As previously discussed the Clinitest, which in the past had been widely used in many dialysis centers, has been found rather insensitive for the purpose of detecting residual formaldehyde concentrations less than 10 ppm (36,43). However, this and similar tests are often used to assure the presence (minimum concentration) of formaldehyde or other disinfectants in the dialyzer after storage. These concentrations of formaldehyde do not exceed the detection limit of the test. This requirement has been included in the AAMI proposed recommended practice for reuse of hemodialyzers (48).

Testing for residual formaldehyde levels in each dialyzer has also been included in the AAMI proposed recommendations with similar requirements found in most other guidelines for dialyzer reuse, including many network guidelines, the California proposed regulations, and the NKF's standards for reuse (47,48,49). Sensitive tests for the presence of formaldehyde include those based on the Schiff, modified Schiff, and Hantzch reactions (36,43). It has been reported that a variety of tests are currently available which are capable of accurately detecting residual formaldehyde in concentrations as low as 5 and 1 ppm (Written Communication). Some guidelines have provisions for allowing a less sensitive more practical (faster and cheaper) method as a routine screen for the presence of formaldehyde by requiring a more sensitive method, with a sensitivity necessary to meet the standard, to validate the rinsing process (49). In these cases the sensitivity of the test was balanced against the ability of the facility to implement the test on a routine basis for each dialyzer without excessive cost and delay in treatment.

Other Disinfectants: Because of the controversy regarding the safety of long-term exposure of both patients and staff to formaldehyde, there has been a search for alternative disinfectants and or sterilants which might be safer. The major alternative chemicals or processes for formaldehyde which have been used or considered for disinfection of hemodialyzers are: ethylene oxide, glutaraldehyde, hypochlorite, hydrogen peroxide, peracetic acid, chlorine dioxide, and radiation. For various reasons, the general use of some of these alternatives is limited. According to a 1984 CDC survey of chemical germicides used for reprocessing dialyzers in dialysis units in the United States, of the approximately 15 percent of the centers that did not use formaldehyde, 12 percent used peracetic acid and 3 percent used glutaraldehyde (50). Recent studies indicate that some of the commercial germicides now available may provide equal or greater antimicrobial effectiveness than formaldehyde (2-4 percent), and at lower concentrations. Lower concentrations and easier removal that result in lower residual levels could reduce the potential for subtle, chronic toxicity problems. Although there is some concern regarding the long-term effects of formaldehyde exposure, presently, there exists a lack of long-term clinical data of the patient effects of residual levels of any dialyzer disinfectant.

Antimicrobial agents for medical devices (dialyzers) are regulated under the authority of the Federal Food, Drug and Cosmetic Act by the Food and Drug Administration (FDA) (51). In addition, they are also regulated by the Environmental Protection Agency (EPA) under the authority of the Federal Insecticide, Fungicide and Rodenticide Act (52). Manufacturers of chemical germicides formulated as general disinfectants, hospital disinfectants, and disinfectants used in other environments are required by EPA to test their formulations using specific protocols for microbicidal efficiency, stability, and toxicity to humans.

In past years, the EPA has resesrved the right to test and verify formulations of chemical germicides for their specified efficacy, however, in practice only those formulations to be registered as sterilants or sporicides were actually tested (53). Additionally, in 1982, the EPA discontinued even this testing. Currently, formulations of chemical germicides are registered by the EPA based on data obtained from the manufacturer. Because the EPA regulates and registers chemical germicides, the Centers for Disease Control (CDC) does not provide its own list of chemical germicides.

Some disinfectants such as formaldehyde are used for medical devices (dialyzers), although they are not labeled for that intended use. These FDA preamendment disinfectants are considered "general purpose articles" which are used in the same form for Medical and non-Medical uses, and are neither labeled nor promoted for any specific medical purpose. According to the FDA, general purpose articles are exempt from registration with the FDA (not the EPA) and thus exempt from listing, premarket notification, and the requirement of the Medical Device Reporting Regulation (54).

For new disinfectants labeled for use on medical devices the FDA requires premarket notification (510 (k)). These disinfectants are considered accessories to the medical device (dialyzer) and included in their indications for use. The FDA defines a disinfectant for medical device as a chemical agent, normally liquid, that kills bacteria, fungi, spores and viruses with a biocidal effectiveness that meets the criteria specified by the FDA. Additionally, the FDA requires a determination of the residue levels on (in) the device before use in a patient, and assessment of safe (or acceptable) level of residue. The means to minimize the residue levels, the means of residue determination and their sensitivity and accuracy, the safe or acceptable levels of residues and the expected residue level after following prescribed rinsing procedures must be tested and must be described in the directions for use (54).

It is incumbent upon the manufacturer to select reliable state-of-the-art methodologies to demonstrate that the safety of the product for its intended use is substantially equivalent to that of a preamendment disinfectant (formaldehyde) labeled for a similar use (54). For blood contacting devices, the FDA requires that the 510(k) contain a hematologic profile (i.e., hemolysis, cell counts and distribution, cell morphology, erythrocyte fragility, clotting time, cold agglutination of erythrocytes, and complement activation). For a new chemical class disinfectant chronic toxicity tests may be needed (54).

In premarket notifications (510(k)) for disinfectants labeled specifically for hemodialyzers the FDA requires that the effect of the disinfectant on dialyzer performance and membrane integrity be evaluated (54). The type of dialyzer and membrane materials should be indicated. The manufacturer is also required to pressure test all dialyzers for blood leaks. And also provide in vitro clearance and ultrafiltration rates. According to the FDA, more than five disinfectants for hemodialyzers were being marketed under Section 510(k) of the Medical Device Amendments to the Food, Drug and Cosmetics Act. FDA has found these disinfectants sufficiently similar in terms of safety and effectiveness to be considered "substantially equivalent" to formaldehyde that was being marketed prior to enactment of the Medical Device Amendments of May 28, 1976 to the Food, Drug, and Cosmetics Act. The voluntary recall of one of the disinfectants (RenNew-D) will be discussed in the section on infections.

The FDA requirements for a disinfectant for a medical device exceed the requirements for a hospital disinfectant as defined by EPA. The CDC uses the system of Spaulding that classifies chemical germicides by the level or degree of disinfection; low, intermediate and high (53). The level of disinfection achieved depends on several factors, principally contact time, temperature, type and concentration of the active ingredients of the chemical germicide, and the nature of the microbial contamination (55). The purpose of disinfecting the dialyzer is to reduce the microbial population associated with these devices to a safe level in order to prevent septicemia and the occurrence of pyrogenic reactions. According to Favero, the use of formaldehyde, or in some cases other chemical germicides, with dialyzers that are processed for reuse, amounts to a high-level of disinfection (55).

Because most centers use formaldehyde as the germicide for disinfecting the dialyzer, most guidelines for reprocessing and reuse of dialyzers are written with an emphasis on formaldehyde as the disinfectant. The AAMI proposed guidelines recommend that the chemical germicide be at least a high-level disinfectant (48). If formaldehyde is used as the sole germicidal agent, the guidelines suggest that a concentration of 4 percent should be used in both the blood and dialysate compartments with a minimum contact time of 24 hours at a temperature of at least 20°C. If equivalent results can be demonstrated under other conditions lower concentrations or shorter contact times are acceptable. According to the guidelines, regardless of the germicide used, it must not damage the integrity of the dialyzer and must rinse out of the dialyzer to below known toxic levels.

Similar recommendations for disinfecting the hemodializer for reuse can be found in the 1984 NKF Revised Standards for Reuse and in many Network developed guidelines for reuse (47). According to these standards, replacement disinfecting agents must be shown to be equivalent to formaldehyde in effectiveness. The recommendation for 4 percent formaldehyde in the AAMI and NKF guidelines is based on information provided by the CDC regarding resistant nontuberculous mycobacteria to lower concentrations of formaldehyde.

In contradistinction to most other guidelines the California proposed regulations only require a formaldehyde disinfectant solution of at least 1.5. percent formaldehyde (49). According to the California Department of Health Services sufficient data and experience have been accumulated by Deane and Bemis to indicate that a 1.5 percent formaldehyde disinfectant solution and the control of waterborne microbiological contamination through the use of reverse osmosis will provide a significant margin of safety, considering the levels and types of initial contamination which may reasonably be expected. Also, while the Department recognizes that other methods of disinfection are available, the regulations require that they be submitted to and approved by the Department (49).

Infections

Introduction: Known microbiologic risks and hazards to the hemodialysis patient exist from exposure to various contaminants on environmental surfaces and in the water used to prepare dialysis fluids (56). These include microorganisms and bacterial endotoxin. Since 1976, the CDC, in cooperation with the Health Care Financing Administration (HCFA), has conducted an annual surveillance of dialysis associated diseases in chronic hemodialysis centers within the United States (57).

Hepatitis: According to the CDC their surveillance of dialysis associated diseases between 1976 and 1985 did not detect any difference in the incidence of hepatitis B infections among patients dialyzed in centers that reuse hemodialyzers as compared to centers that do not reuse (50,58,59,60). Moreover, while viral hepatitis type B has long been recognized as a hazard to both patients and staff in the hemodialysis setting there has been a significant decrease from 1976 to the present in the incidence of hepatitis B infection in hemodialysis centers. In 1976, the incidence of hepatitis B surface antigen seropositivity (HBsAg) among 33,875 patients was 3.0 percent, compared to 0.5 percent of 67,229 patients in 1983 (50).

According to Alter and coworkers, this decrease appears to be due to CDC infection control strategies that include segregation of HBsAg-positive from HBsAg-negative patients, better environmental control procedures, and implementation of better serologic surveillance systems. Of interest is the finding of a significantly higher incidence of HBsAg-positivity among patients found in those centers located in hospitals compared with freestanding centers (60). Based on the knowledge that the majority of hemodialysis centers that reuse hemodialyzers are nonhospital for-profit facilities one might expect the incidence of hepatitis B infection to be lower in facilities that reuse hemodialyzers. Petersen believes that there is a widespread policy of not reusing dialyzers from HBsAg-positive patients and that this policy may account for the lack of an association between the reuse of hemodialyzers and the risk of hepatitis B infection among patients and staff (61). In addition to recommending against the reuse of dialyzers from HBsAg-positive patients, Petersen also suggests that facilities use a small length of disposable tubing between blood parts and any permanent tube in the reprocessing facility. He believes this will prevent cross contamination between blood ports on different dialyzers. This procedure is required in the California proposed regulations and recommended in the AAMI proposed guidelines (48,49).

The NKF Revised Standards for Reuse (1984) specifically state that the reuse of dialyzers is not recommended in patients who are hepatitis B antigen positive (47).

Whereas the AAMI proposed guidelines for hemodialyzer reuse suggest that facilities consider and state in writing whether and/or how reprocessing will be done for special medical conditions (e.g., hepatitis, AIDS, septicemia, sensitivity to materials used in hemodialyzer reprocessing) (48). The California proposed regulations would prohibit the reuse and reprocessing of hemodialyzers in patients known to be HBsAg-positive or suspected to have non-A/non-B hepatitis, except where the dialysis patient treatment area and the dialyzer reprocessing area or room is isolated from patients free of hepatitis. The regulations would also prohibit reuse in patients sensitive to disinfectant solution residuals and in bacteremic patients (49).

Pyrogenic reactions: Chills, fever, hypotension, nausea, and myalgia, all symptoms sometimes observed during hemodialysis, are commonly termed pyrogenic reactions. Gram-negative bacteria all contain bacterial endotoxin (lipopolysaccharide) which can cause these pyrogenic reactions in dialyzing patients if the endotoxins, are introduced into the blood stream (56). Water that is produced in a dialysis center to prepare dialysis fluids including the disinfectant solution is not sterile and does contain these types of organisms. While chemical germicides such as formaldehyde may inactivate the microorganisms the endotoxins may remain. According to Petersen, during storage of the dialyzer, the endotoxin migrates from the disinfectant solution to the membranes and is not entirely removed when the disinfectant is rinsed from the dialyzer prior to reuse (61). Petersen found that if the disinfectant contains sufficient endotoxin of adequate pyrogenicity, the dialyzer may become pyrogenic and cause endotoxemia in the patient who uses the dialyzer.

CDC survey data, however, for the period from 1976 to the present does not show an association between reuse of hemodialyzers and increased risk of endotoxemia (pyrogenic reactions (57). The sensitivity of this surveillance system (survey), the same one used to determine the incidence of hepatitis, has not been assessed by the CDC (Written Communication). According to Petersen, although the surveillance did not reveal an association between the reuse of dialyzers and an increased risk of pyrogenic reactions this has been the area in which the CDC has recieved the most requests for assistance (61).

Different dialysis centers reported to the CDC that occasional, frank pyrogenic reactions occurred in patients being dialyzed with reused dialyzers but not in patients using new dialyzers. Petersen found that in each case, the aqueous formaldehyde solution used to disinfect the dialyzers before reuse was prepared either with water that had not been treated to remove endotoxin or with treated water that had been allowed to stand in a tank for several days before use (61). From samples of water used to prepare the disinfectant solutions Petersen detected levels of endotoxin capable of causing pyrogenic reactions. Conversely, Kant and colleagues suggest that symptoms and signs of infection or pyrogenic reactions such as fever, chills or discharge among patients using dialyzers are significantly less in patients reusing their dialyzers (19). Although, the population studied was small there was a great deal of attention paid to the quality of methods used for reprocessing the dialyzers.

Because Petersen and other investigators at CDC have not observed pyrogenic reactions associated with disinfectant solutions containing endotoxin at levels less than 1 nanogram per milliliter (ng/ml) they recommend a maximum of 1 ng/ml of endotoxin in the water used to prepare the disinfectant (56,61). According to Petersen the major dose of endotoxin to a patient may result from receiving a bolus of priming fluid at the start of dialysis. He recommends a procedure, similar to the recommendation by Lewis (36) to reduce formaldehyde exposure, that discharges the priming fluid and replaces it with fresh saline just prior to the initiation of treatment. His laboratory simulations have shown that this procedure reduces the dose of endotoxin from a contaminated dialyzer by more than 90 percent (61). No CDC guidelines for endotoxin levels have been recommended for the dialyzer rinse water or cleanser diluent. According to Bland and Favero, with the relatively short contact time, there is probably an insignificant retention by the dialyzer of endotoxins from these fluids. In regard to the water used to formulate disinfectant most guidelines such as the NKF Revised Standards for Reuse recommend that facilities meet the water quality requirements specified in the "Standards for Hemodialysis Systems" proposed by AAMI in May 1982 (62). This recommendation is considered sufficient to minimize exposure to endotoxin and subsequent pyrogenic reactions. In regard to the water used to formulate cleaning solution and to rinse dialyzers, most guidelines recommend that facilities at least meet the water quality requirements specified in the "Standards for Hemodialysis Systems" proposed by AAMI (62).

Bacteremia: According to Uman and associates bacteremia in patients undergoing hemodialysis is a relatively rare event despite the frequent occurrence of febrile episodes in this population (63). Nevertheless, if bacteremia develops in patients undergoing dialysis, they are at increased risk for endocarditis and systemic infection because of the presence of fistulas or shunts and the decreased resistance to infection in uremia (63). Because CDC has not included in their surveillance activity any specific questions dealing with increased rates of bacteremia associated with the reuse of hemodialyzers there is no data covering this potential hazard on a national basis (61). However, a few episodes of bacteremia that may have resulted from hemodialyzer reuse have been reported.

In 1977 Wagnild and colleagues reported pseudomonas aeruginosa bacteremia in a dialysis unit reusing coils and using benzylkonium chloride as the disinfecting agent (64). Pseudomonas aeruginosa was cultured from the blood of 10 of 17 patients (59 percent) during 18 of 201 dialyses, and one patient died of pseudomonas endocarditis. According to the authors the coils probably became infected by a low level of bacterial crossover from the dialysate to the blood compartment. After many uses (5), the number of residual bacteria in the coil became large enough in many instances to lead to bacteremia during dialysis. Wagnild concluded that their method of cleaning and disinfecting coils using benzalkonium chloride did not eradicate pseudomonas (64).

An earlier report by Kuehnel and Lundh of bacteremia associated with the reuse of dialyzers also involved coil dialyzers and benzalkonium chloride (65). In this episode pseudomonas cepacia was grown from the blood of 16 of 33 patients with 13 of the 16 patients becoming clinically ill. The authors only found clinically apparent bacteremia when the coils were inadvertently left unrefrigerated for several days and then reused. Kuehnel and Lundh concluded that the episode of bacteremia was due to an inadvertent omission of a step of the sterilization and storage procedure (65). The use of coil dialyzers was less than one percent by 1983 (58). Also, benzalkonium chloride is no longer used to disinfect dialyzers for reuse.

In 1982 Petersen reported that from all the calls to the CDC from the dialysis centers for assistance, there were two clusters of bacteremias that may have resulted from hemodialyzer reuse (61). In one episode he concluded that the probable cause of the bacteremia was the use of contaminated water to rinse the disinfectant from the dialyzers. In the second episode he concluded that the 0.5 percent formaldehyde disinfectant found in the reprocessed dialyzer was probably insufficient to inactivate the high levels of bacteria that were found present in the water used to prepare the disinfectant.

Fluids used to rinse and clean residual blood from the dialyzer can be contaminated with a variety of gram-negative bacteria or non-tuberculous mycobacteria since both groups occur naturally in water (61). Although the microbiologic quality of this water should be of major concern, Petersen has found that in many centers it is perceived that the level and types of bacteria in water used during the reuse process is of little or no concern. This he feels is based on a belief that any bacteria introduced into the dialyzer during cleaning will subsequently be inactivated during the disinfecting procedure (61). According to Petersen the most likely source of microbial contamination that challenges the dialyzer disinfection procedure is the water used to prepare the disinfectant solution. This fluid usually remains in the blood compartment for 36-40 hours, and bacteria resistant to the disinfectant may become attached to the membrane surfaces. Previously, it was believed that if the level of microbial contamination (gram-negative bacteria) in the water used to rinse dialyzers was maintained below 200 colony-forming units per milliliter, the germicidal activity of 2 percent formaldehyde disinfectant would produce a microbiologically acceptable dialyzer for reuse (56).

In 1984 experts attending an AAMI Conference on reuse recommended that formaldehyde concentration be increased from the approximately 2-percent concentration conventionally used for disinfection to 4 percent (55) (56). The basis for this recommendation was that 4% killed all resistant nontubercular mycobacteria (NTM) after 24 hours incubation, whereas 2% did not (57). NTM had been associated with a 1982 outbreak of infection in two Louisiana dialysis centers engaged in reuse (5). One center was used to reprocess all dialyzers. Fourteen of the 27 patients (51 percent) with multiple underlying medical problems died. While the CDC epidemiological investigation did not identify any one risk factor to account for the outbreak, one factor common to all patients was exposure to reprocessed hemodialyzers.

After extensive environmental sampling CDC found NTM in water samples from multiple sites in both dialysis centers, including water used to rinse dialyzers before the disinfection procedure, to prepare the 2 percent formaldehyde solution used in the disinfection procedure and to prepare dialysis fluid (5). Additionally, NTM were present in the blood compartment of five of 31 dialyzers sampled after the routine disinfection procedure. The formaldehyde concentration in two of three culture-positive dialyzers tested was less than 2 percent. Two-percent formaldehyde was the concentration routinely used for disinfection.

As a result of this outbreak and additional studies, the CDC has suggested that physicians and dialysis center staff should be alert to the possible existence of NTM infection in hemodialysis (reuse) patients, particularly because such infections may result in minimal, nonspecific symptoms. They recommend that patients with signs or symptoms of infection, especially those with unexplained fever, should have appropriate cultures taken that are held for at least 14 days (5).

In a 1985 report of the Louisiana outbreak, Bolan and coworkers concluded that the most likely source of infection in this outbreak was the water used to process the dialyzers (66). They found that certain features of the design of the water treatment system, such as the presence of storage tanks, may have led to high concentrations of these organisms in the water used to process the dialyzer. Additionally, there may have been variations in the concentration of the stock formaldehyde solution used to disinfect the dialyzers which may have resulted in incomplete eradication of NTM from the dialyzers.

The study by Bolan and other studies have shown that although the majority of infections in this outbreak were due to NTM strains susceptible to 2 percent formaldehyde, a NTM strain highly resistant to the 2 percent formaldehyde was also isolated as a pathogen in this outbreak (56,66). The authors concluded that the practice of using 2 percent formaldehyde is a marginal disinfection procedure when nontuberculous mycobacteria are present in waters exposed to the reprocessed dialyzers (55,56,66). Moreover, they showed that at concentrations of 4 percent all infecting organisms were eliminated. In 1983, scientists from the Center for Disease Control who participated in an AAMI technology assessment conference on reuse of disposables indicated that that "by applying good techniques, adhering to rigid protocols, and by using high-level disinfectant procedures, which now means 4 percent formaldehyde, it seems that dialyzers can be reused without undue risk of infections or pyrogenic reactions to dialyzing patients (55)."

Recently, the District of Columbia has completed a survey of 15 hemodialysis facilities to identify potential and or existing problems related to hemodialysis (67). The investigators reported that the incidence of sepsis/bacteremia appeared to be more prevalent among the freestanding facilities with a concentration of cases in those facilities which practice reuse of blood-lines and dialyzers. In these facilities blood-lines were usually disinfected with a 2 to 2.8 percent formaldehyde solution. The authors note that cases of infection in the hospital-based facilities may have been missed and at the same time cases of infection reported by the freestanding facilities may not have been associated with reuse (67). From this survey they acknowledged that it is premature to ascribe cause-and-effect relationships between reuse and high rates of sepsis.

As a result of the survey, the investigators found that most hemodialysis facilities use the disposable transducer filter multiple times. These filters are not reprocessed (disinfected) between uses and are changed only when there are signs of contamination. According to the investigators, filters, as a function of their role in protecting the transducer poses a high potential for contamination. The investigators in the D.C. survey recommended that transducer filters not be reused (67).

In 1984, a survey of chemical germicides used for reprocessing showed that more than 35 percent of the dialysis facilities in the United States used less than 4 percent formaldehyde as a disinfectant (50). Facilities that adopt the 4 percent level will require a substantial increase in required rinsing time, depending upon the final residual formaldehyde level targeted. With a 4 percent formaldehyde disinfectant and a 1 ppm formaldehyde residue required, the rinsing time will be 45 minutes, for 5 ppm the rinsing time will be 15 minutes (46). Extra time needed for removal means extra costs. Recently, attempts have been made to improve the bacteriological efficacy of formaldehyde without increasing its concentration. Preliminary in vitro testing by Hakim and associates indicates that the bactriocidal effectiveness of formaldehyde can be improved by increasing the temperature of incubation, by adding ethanol, or both (68). At higher temperatures more of the formaldehyde exists in a non-hydrated state, leading to improved bacteriological activity. Additionally, increased metabolic activity of the organism at higher temperatures may also lead to increased incorporation of the formaldehyde in the cell wall, contributing to their destruction. According to Hakim the detergent effect of simple alcohol may increase contact between formaldehyde and the bacterial cell wall (68).

With a 1 percent formaldehyde solution and incubation of the stored dialyzer at 40°C Hakim observed complete eradication of the formaldehyde-resistant organisms tested. Moreover, there was no effect of incubation at 40°C on the in vitro clearance determinations of new and reused dialyzers. The authors concluded that the use of lesser concentrations of formaldehyde adequately disinfect dialyzers when incubated at higher than room temperatures and, possibly, with or without the addition of ethanol (68).

Both the National Kidney Foundation and AAMI have incorporated the 4 percent level of formaldehyde disinfectant in their draft guidelines (47,48). The State of California Department of Health Services is requiring a minimum of 1.5 percent formaldehyde disinfectant in conjunction with water treated by reverse osmosis (RO) (49). The use of a reverse osmosis membrane supposedly ensures that there will be no introduction into the dialyzer of viable or nonviable bacteria or pyrogenic bacterial endotoxins from the water. However, CDC scientists question the effectiveness of the RO water to control contamination with non-tubercular mycobacteria. According to Hakim these organisms can multiply even in treated water or in water that had undergone distillation or reverse osmosis because of their ability to utilize trace quantities of organic carbon and nitrogen as nutrient energy sources (68). In 1984, from a random sampling of 115 dialysis centers, CDC found that at almost 50 percent of the centers the water used to prepare dialysate or reprocess hemodialyzers contained mycobacteria (57).

Many of the proposed guidelines for reuse and reprocessing of dialyzers contain sufficient recommendations for controlling the introduction of microorganisms to the dialyzer during reprocessing and for providing disinfection that should adequately eliminate microorganisms that may be present in the dialyzer prior to use. Some of the more comprehensive water quality recommendations can be found in the AAMI, California and Network 15 guidelines and/or regulations for hemodialyzer reuse (47,48,49). Not only do these guidelines present recommendations for bacterial and endotoxin limits, water treatment, monitoring, and storage but also include patient surveillance procedures that monitor reuse patients for clinical signs and symptoms of infection. According to Petersen and other CDC investigators, patient surveillance systems sensitive to potential risks associated with reused dialyzers (e.g., viral hepatitis, bacteremia, endotoxemia) provide an excellent means of verifying the effectiveness and safety of the reprocessing procedures (61).

Guidelines for reuse and reprocessing of dialyzers do not usually contain specific recommendations for the chemical quality of the water used in reprocessing. The AAMI water quality requirements specified in the "Standards for Hemodialysis Systems" recommend maximum levels of chemical contaminants (inorganic) for the water used to prepare the dialysate (62). Although there is concern regarding the possibility of chemical (inorganic and organic) absorption by the dialyzer membrane during reprocessing there is little information concerning the effect of chemicals on any aspect of reprocessing. According to Bland and Favero a definitive maximum level of contamination in the water used to rinse dialyzers or prepare dialyzer disinfectant cannot be identified at this time. However, they suggest that it would be prudent to treat at least the water used to prepare the dialyzer disinfectant in a manner that would substantially remove chemical (inorganic, organic) contaminants (56).

Recent Outbreaks and Recalls: Recently, it has been reported by the CDC that outbreaks (clusters) of gram-negative bacteremia in patients at four free-standing hemodialysis clinics were associated with the reuse and reprocessing of disposable hollow-fiber hemodialyzers (6). These dialyzers had all been disinfected with a recently introduced sporicide/disinfectant, RenNew-D. On-site investigations by CDC and FDA have been performed at two of the four clinics where a total of nine patients met the CDC case definition of intradialytic sepsis. Although five patients at one of the clinics had positive blood cultures following dialysis using dialyzers reprocessed with RenNew-D solution, only four met the CDC case definition. The fifth patient, who eventually died, was not included because of his febrile condition at the initiation of treatment (6). The absence of signs or symptoms of infection at the initiation of the dialysis session was a necessary condition for consideration in the case definition. By only using patients that met the case definition the investigators were able to corroborate the link between the patient reactions and the disinfectant.

According to the CDC report a review of the microbiologic records in the two centers showed no clusters of gram-negative bacteria during the preceding 6 months. However, these two clinics had been using RenNew-D for reprocessing dialyzers for only 6 weeks and 4 months respectively, before the first documented case of bacteremia. At one clinic 10 of 20 hemodialyzers showed bacterial contamination of the blood compartment after reprocessing with RenNew-D. Even after changes in the mixing and handling of the disinfectant gram-negative microorganisms were identified in samples of the predialysis saline rinse (6 percent), and in blood cultures from patients (11 percent).

Because it had not been determined why the hemodialyzers showed evidence of contamination after reprocessing with RenNew-D the manufacturer initiated a voluntary recall of all lots of the product. The FDA considers this situation a critical public health problem and has classified the manufacturer's action as a class I recall, requiring follow-up monitoring by FDA (Written Communication). As a result of these outbreaks the CDC has recommended that providers of hemodialysis services that reuse dialyzers have evaluation programs that include active surveillance of patients for both infectious and noninfectious complications. They suggested that clinical, laboratory, and epidemiologic information about patients experiencing adverse reactions be recorded in the patients medical record as well as in a log book, so that the incidence rates of these complications can be determined (6). Although the CDC maintains that if the reprocessing procedure is done correctly with an effective disinfectant there does not appear to be any significant risk to patients, it would encourage as a result of these outbreaks, additional studies of the functional and microbiologic quality of reprocessed dialyzers, as well as the factors affecting their clinical safety (6).

According to the manufacturer and distributor of RenNew-D the outbreaks at two of the clinics may have been due to the lack of treatment of the water used to prepare the disinfectant at one center and inadequate filling of dialyzers with RenNew-D solution at the other (Written Communication). However, they are unable to explain the rapid degradation of the bulk RenNew-D solution at at least one of the clinics and are presently re-evaluating its safety and efficacy (Written Communication).

According to the CDC and FDA, they are presently investigating outbreaks of bacteremia or sepsis in patients who had been dialyzed with membranes that had been disinfected with renalin (peracetic acid). This investigation is in progress at this time. At least two centers in Georgia and one in Fort Worth are currently being investigated by the CDC and FDA in connection with these outbreaks.

Clinical Issues

Adverse reactions may occur with new dialyzers or reprocessed dialyzers. Burning, headaches, chills, and fever may occur with a reprocessed dialyzer, while chest pain, back pain, shortness of breath, and low blood pressure may occur with new dialyzers but similar reactions have also been reported following multiple use of dialyzers (11,24,69,70). While some symptoms may be due to conditions unrelated to the dialyzer, studies have reported that some intradialytic symptoms are less frequent in patients treated with reprocessed dialyzers as compared with patients receiving new dialyzers (69,22). Complement activation, an index of biocompatibility, has been shown by Hakim and coworkers to be significantly greater during first use of Cuprophane and cellulose acetate dialyzers than during reuse of these dialyzers (22). And in a subsequent study Hakim and colleagues found an association between the level of complement activation and the adverse allergic reactions experienced by the patients (70). Complement is activated by blood contact with tubing and dialysis membranes.

Exposure of blood to cellulosic membranes used in artificial kidneys results in leukopenia within the first 30 minutes of dialysis (23). Clinically, this has been associated by some clinicians with respiratory distress and chest and back pain (71). Complement activation via the alternate pathway, pulmonary leukostasis, and hypoxemia, occur simultaneously with leukopenia and symptoms (23). The symptoms vary from patient to patient as to frequency and intensity, but the leukopenia is a constant finding on first use of cellulosic membranes (23). According to Ogden these relatively rare reactions to new dialyzers may be mild and self-limited or may require treatment (71).

With subsequent uses of reprocessed dialyzers, investigators find that the leukopenia and symptoms attenuate (22). In a double blind study of 29 patients, Bok and colleagues observed that dialyzer reuse ameliorates some symptoms associated with new dialyzers (69). The membranes used in the study were regenerated cellulose, cellulose acetate and cuprophan. They found that the incidences of chest pain and back pain were more frequent with new than with reused dialyzers. The authors suggested that these improvements could have resulted from the decreased leukopenia associated with the reduction in complement activation that occurs with protein coating of the membrane.

Kant and Pollack in their retrospective study of the safety and efficacy of dialyzer reuse reported that the incidence of chest pain and cramps is lower during resuse than during first use (19). They also found that fever, sweating, chest pain, respiratory distress, hypotension, nausea and vomiting were all less frequent in the facility practicing reuse. This effect has been considered an index of dialyzer biocompatibility and is also dependent on the material used in the manufacture of the membrane (22). Different membranes show differences in their ability to activate complement and induce leukopenia. Of the cellulosic membranes, cuprophane is the most reactive and cellulose acetate is the least. Ivanovich and associates have recently reported significant reductions in dialysis related symptoms and in complement activation with the use of cellulose acetate membranes as compared to Cuprophan following a prospective bliNded crossover study (72). Henderson reported that polyacrylonitrite shows no leukopenia and virtually no complement activation (73). According to Walker both cellulose acetate and polyacrylonitrite appear to be relatively free from the problem of dialyzer (Cuprophane) hypersensitivity which is chartacterized by acute chest and back pain, dyspnea and diaphoresis with hypotension (74). Hakim suggested that patients with the first-use syndrome may benefit from dialysis with other types of membranes that cause less complement activation, such as polyacrylonitrile or polymethylemethacrylate (70). According to Walker its incidence has been reported as 3.5 episodes per 100,000 new dialyzers (of hollow fiber construction) (74). Other estimates for the incidence of first-use syndrome range from 0.06 percent (Ing) (75) to 3 percent (Hakim) (70) to 26 percent (Deane and Wineman) (76). Anaphylactic reactions to new cuprophane membranes have an estimated incidence of 3.5 reactions per million dialyses (70).

New dialyzer syndrome was reported to the CDC by 43 percent of (1,205) dialysis centers in 1984 (50). Twelve percent of centers reported anaphylactic reactions associated with new dialyzers, 17 percent of centers reported endotoxemic reactions associated with new dialyzers, and 14 percent of centers reported both types of reactions associated with new dialyzers. According to the information provided in the survey these reactions were twice as likely to occur in patients on new dialyzers compared with patients on reused dialyzers.

According to Sadler white blood cells that become sensitized by the dialysis membranes (membrane specific) and tubing are sequestered for a few hours in the reticuloendothelial system, producing a neutropenia for the first two to three hours of a dialysis treatment (14). Hakim found that complement activation as well as neutropenia is significantly attenuated with reuse (22). However, Sadler reported that no symptoms and no disease have ever been associated with either the complement activation or the neutropenia associated with hemodialyzers (14). Hakim and Lowrie, however, proposed a correlation between impaired neutrophil function and the high rate of infection in patients on chronic use of new dialyzers (23). Kant and Pollak found that patients spent more days in hospitals for dialysis related complications with single use than multiple use (19). In a more recent study at the same facility Robson and coworkers determined the effect of multiple dialyzer use on intradialytic symptoms in 147 patients over a 26-month period (24). Robson reported that all symptoms considered together occurred 1.3 times more frequently during the initial than during the subsequent use of the dialyzer. Also, concurrent chest and back pain were 41 times more frequent when the dialyzer was used for the first time.

The cause of these reactions to new dialyzers and blood tubing is not known, although recent work has done much to improve the understanding of patient-dialyzer reactions. The influence of endotoxins and patient immune specificity are factors to be considered in evaluating this syndrome. According to Pizziconi and colleagues the removal of endotoxins is a prerequisite to identifying and correlating factors associated with complement activation and neutropenia caused by cuprophane membrane (77). However, Pizziconi found two thirds of the hemodialysis patients studied presented neutropenia caused by cuprophane in the absence of any detectable endotoxins. Although the incidence of first-use syndrome with a new dialyzer is debatable there is agreement that the syndrome is rare or absent with reused hemodialyzers.

Clearance is the most familiar and important clinical perameter of membrane performance. It is a measure of solute transport of the hemodialyzer. Clearance must be maintained within acceptable limits to ensure that there will be enough dialysis to prevent uremic complications. The guidelines and/or requirements of the NKF, state of California and AAMI all specify that the acceptable tolerance for urea or sodium clearance (rejection criterion) of the dialyzer should be ± 10 percent of its initial value (47,48,49). This is considered clinically acceptable and does not result in a clinically significant change in the BUN of the patient (48). Numerous studies reported in the literature have demonstrated the preservation of dialyzer clearance after multiple reprocessing and reuse (76,78,79). A recent study of dialyzer performance over prolonged reuse has been reported by Gagnon and Kaye (78). They found the clearances of urea, creatinine, and phosphate were not significantly decreased when measured in vivo, in 16 patients, up to the thirtieth dialyzer reuse. Similarly, clearance measurements obtained in vitro for the same three solutes did not differ significantly from the first to the thirtieth dialyzer use. Clearances of vitamin B12, a larger solute, was also maintained over similar extensive dialyzer reuse. It is important to note, as a prerequisite to their continued reuse, that none of the dialyzers tested had measurements of fiber bundle volume and ultrafiltration rate different by 15 percent or more from initial values (78). Most other studies and proposed guidelines for reuse such as NKF, AAMI and the State of California allow a loss of fiber bundle volume (total cell volume) of less than 20 percent (under specified conditions) because it corresponds to a loss of urea clearance of about 4-11 percent (47,48,49).

Similar results of acceptable levels of clearances and ultrafiltration rates after multiple reprocessing and reuse has recently been reported by Bourke and coworkers (79). They reported no significant difference in the in vivo urea and creatinine clearances of dialyzers in 9 patients after as many as 12 uses. Also, there was no change in the ultrafiltration rates (79).

Because heparin is an anticougulant it is usually given to patients prior to and during dialysis to prevent clotting. A few reports indicate that increases in the dose of heparin may be required in patients dialyzing with reprocessed dialyzers (80). Goodship reported that 7 of 21 facilities practicing reuse in the U.K. increased the heparin priming dose and heparin infusion rate as a result of reuse. Also, formaldehyde has been shown to be a potent inhibitor of heparin and heparin requirements, may need to be increased especially for the loading dose as a result of residual formaldehyde in the dialyzer (1).

Although the measurement of the clearance capability of the dialyzer is the most direct method of assessing dialyzer performance, it is not regularly performed in the reuse setting and tends to be costly when done (47). More practical indirect quality control tests related to the mass transport characteristics of the dialyzer have been devised (16). Because of the long and successful experience with the indirect measurement of fiber bundle volume as a measurement of acceptable functionality of the hollow fiber dialyzer when volume is greater than 80%, the NKF, AAMI and State of California all accept this method for determining dialyzer performance (47,48,49). /The AAMI guideline also accepts in vitro ultrafiltration rate measurements as an indirect measure of solute clearance for hollow fiber, parallel plate and coil hemodialyzers. The facility is required to determine the membrane resistance corresponding to a ± 10 percent change in urea or sodium clearance (47).

Blood tubing sets provide the conduits through which blood is delivered to and from hemodialyzers during dialysis therapy. According to Keshaviah the risks and hazards associated with blood tubing sets are related to mechanical failures, particulate contamination, microbial contamination, toxicity of plastic tubing and toxic residue from sterilization (1). It remains to be evaluated how reprocessing and reuse of the blood tubing sets would affect these concerns, including the "leaching out" of plasticizer from the tubing to the patient's blood during hemodialysis. No data exist nor are guidelines proposed that would address methods for reprocessing or reusing blood tubing sets or the number of uses that are optimal.

Extent of Reuse Practice

Reuse of hemodialyzers began over 20 years ago (26). By 1976, 18 percent of the dialysis centers reported that they reused dialyzers. From 1976 to 1983, a dramatic increase occurred in the percentage of centers that reported reuse of disposable dialyzers (18 to 52 percent). In the same time period that reuse was increasing the use of hollow fiber dialyzers, considered the most suitable hemodialyzer for reuse, increased from 6 percent to over 60 percent. The use of coil dialyzers decreased from 35 percent to less than 1 percent and the use of parallel plate dialyzers decreased from 8 to 4 percent. Formaldehyde is the chemical germicide used for reprocessing dialyzers in 85 percent of the centers that reuse. About thirty-four percent of the dialysis centers use a formaldehyde concentration of 4 percent. Many centers (37 percent) use less than a 4 percent formaldehyde concentration while some use peracetic acid (12 percent of centers) and others gluteraldehyde (3 percent of centers) (50). Until the recent recall of RenNew-D (chlorine dioxide) some of these centers (5 percent) had switched to this recently introduced chemical germicide.

Presently, about 60 to 70 percent of the dialysis patients are being treated with reused dialyzers in about 60 percent of the centers. While the average number of reuses nationally is probably between 6 and 10 times, dialyzers reused as many as 50 times have been documented (6). However, information provided by the D.C. survey of hemodialysis facilities (67) and the state of Colorado indicate that the average number of reuses for a dialyzer may be greater than previously stated. The D.C. investigators found that hemodialysis facilities were reprocessing dialyzers as many as 20 and 30 times. Colorado hemodialysis facilities have reported reusing dialyzers 20 to 23 times, averaging 10-12 reuses for a dialyzer (personal communication). Although the patterns of reuse of blood lines, transducer filters or dialyzer caps is not well documented, it seems that the reuse of blood lines is increasing. For example, in a report (Alcide/Cobe) of one of the outbreaks associated with RenNew-D the investigators found that the center was disinfecting the dialyzers with the blood-tubing sets left in place. Moreover, this practice was not recommended in the RenNew-D procedures (Written Communication). However, the center is located in an ESRD Network (Network 11) where Network guidelines for reprocessing address blood-line reuse and do not recommend against it (Written Communication). It was also noted in the report that at this same center, not only were the dialyzer caps reused, but they were reused after only being rinsed with water (Written Communication).

While the CDC has no data on the reuse of blood lines, transducer filters, and dialyzer caps the FDA has recently received some information regarding their use. This information is contained in a report of the D.C. survey of hemodialysis facilities, prepared for the FDA to help identify problems encountered in hemodialysis centers (67). Similar state reports are being prepared by Ohio, Massachusetts and California. The survey data collected from 15 hospital-based and freestanding hemodialysis facilities in D.C. showed that 7 of the facilities reused dialyzers and 6 of the 7 also reused blood tubing sets (67). Actually there are 16 hemodialysis facilities in D.C. of which 8 reuse dialyzers and 7 of these also reuse blood tubing sets (67).

The investigators found that in the facilities that reused blood tubing sets there were established procedures for the reprocessing that included pressure testing. According to the report the occurrences of blood tubing set failures during treatment (leaking, malocclusion of unions and fittings, splitting) were higher in facilities which practice reprocessing and reuse of arterial blood tubing sets (67). It is important to note, however, that almost 90 percent of the tubing incidents were attributable to one specific tubing manufacturer and these tubings were the ones utilized in the freestanding hemodialysis facilities with blood tubing reprocessing and reuse.

The D.C. report also provided information on the extent of reuse of the disposable pressure monitor transducer filter (protector) (67). The investigators found that while none of the facilities that practice reuse of dialyzers or blood lines reprocess (disinfect) transducer filters, all but one subject the filter to multiple use and change it only when there are signs of contamination. The investigators added that: "Reuse of this contaminated protector without adequate sterilization could result in a potentially hazardous situation, especially when used on a different patient. It also follows that reuse for the same patient could also pose a risk as, by its structure, adequate flushing and rinsing is highly unlikely with a potential source of bacterial growth resulting. Transducer protectors should not be reused."

The extent of reuse of hemodialyzers and especially the ancillary pieces of hemodialysis equipment has been found to vary widely across centers. An OHTA informal telephone survey of ESRD Networks contacted 29 of the 32 Network Programs. From that survey it was determined that in about 12 of the Networks more than half of the hemodialysis facilities reused dialyzers, while in another 9 Networks less than half of the facilities reused. In 5 of the Networks more than 75 percent of the hemodialysis centers reused hemodialyzers. The reuse of dialyzers in the ESRD Networks contacted varied from less than 10 percent of the facilities in some Networks to greater than 90 percent in others.

Little information was available from the Networks regarding the extent of reuse of blood lines, transducer filters and dialyzer caps. Network 7 (Upper Midwest), in contrast to the D.C. data discussed above, informed OHTA that none of the Network's 14 facilities that practiced reuse of dialyzers reused blood-lines. Also, all 14 facilities practicing reuse in Network 7 use automated reprocessing systems. However, the percentage of facilities practicing reuse in the U.S. using automated reprocessing devices has not been determined, but is probably increasing.

Proposed Guidelines and/or Recommendations

At present, there are no universally adopted nor are there federal standards for the reprocessing and reuse of hemodialyzers, blood tubing sets, transducer filters and dialyzer caps. While many proposed draft guidelines and/or recommendations are available, usually addressing dialyzers only, none of these is required and they do not address blood lines and tubing or transducer filters or dialyzer caps. Two proposed guidelines that come the closest to being considered universal are the National Kidney Foundation's Revised Standards for Reuse of Hemodialyzers (1983) (47) and the Association for the Advancement of Medical Instrumentation's Recommended Practice for Reuse of Hemodialyzers (proposed) (48). The AAMI recommended practice for reuse is completed with approval expected in 1986. Both these guidelines, which specify prodcedures for reprocessing dialyzers, are considered reasonable by the CDC (Personal Communication). And both the CDC and the FDA have collaborated with many other health care professionals, patients, and industry representatives on the AAMI hemodialyzer reuse subcommittee to develop the voluntary AAMI recommended practice for reuse of hemodialyzers.

The proposed AAMI guidelines as well as the California proposed regulations for reprocessing and reuse of disposable hemodialysis filters are probably the two most comprehensive guidelines/regulations available for the reprocessing and reuse of dialyzers (48,49). These guideline/regulations and the NKF guidelines to a lesser degree, provide reprocessing protocols addressing record keeping, facility requirements, personnel requirements including training, patient monitoring, hemodialyzer cleaning, performance, disinfection, storage, and rinsing, and water quality. A major element of both the AAMI proposed guidelines and the California proposed regulations is a recommendation/requirement for a validation-quality assurance audit of all procedures and tests performed in conjunction with the reprocessing of hemodialyzers (48,49).

Both the AAMI draft guidelines and the California proposed regulations would recommend/ require the dialysis facility practicing reuse to regularly provide the assurance that the protocol recommendations/requirements are being met (48,49). These quality assurance audits include a review of written policies and procedures and verification that the action and practices of facility personnel comply with them. The audits would also determine that the materials, process tests and performance of the final product (dialyzer) meet the designated specifications. Because the AAMI and California documents include all the recommendations/requirements previously discussed they are considered among the best efforts, to date, for providing a safe and effective reused dialyzer. However, adoption of comprehensive protocols such as those developed by AAMI and the state of California will not necessarily resolve such reuse issues or controversies as risks from formaldehyde exposure and appropriate water quality standards. They would, however, improve and standardize the quality of care of patients in facilities that reprocess and reuse dialyzers.

Whether to make the AAMI or some other recommendations mandatory for hemodialysis facilities that practice reuse, and how to accomplish that feat is presently being debated and addressed by the FDA and HCFA. Because the Good Manufacturing Practice (GMP) regulation is a mandated quality assurance program for manufacturers of medical devices and because 21CFR Sec 820.3(d) defines any person who repackages or relabels a device as falling under the purview of GMPS, there are those who desire that the FDA impose the GMPs on reprocessors of dialysis devices (81). They believe that this will establish quality control and uniform standards in hemodialysis facilities that reuse. The reuse committee of the FDA is considering this as well as other options that it hopes will assure the safety and effectiveness of hemodialyzers processed for reuse.

It is important to note that there are some crucial differences between some of the proposed recommendations and requirements specified in the AAMI, NKF, and California Protocols (47,48,49). For instance where AAMI and NKF recommend a 4 percent formaldehyde disinfectant, California would require only 1.5 percent (47,48,49). However, California would require a formaldehyde residue of less than 1 ppm where AAMI and NKF would accept less than 5 ppm (47,48,49). Both NKF and California specifiy patient consent and choice, AAMI does not address this issue (47,48,49). Neither

AAMI nor the NKF address the reprocessing of blood-lines, California would allow it provided the blood-tubing is treated as an integral part of the dialyzer (47,48,49). And only the NKF revised standards for reuse have specific criteria (e.g., six or more visible, dark, clotted fibers) for discarding on esthetically unattractive dialyzer (47).

The involvement of states in the reuse practice of hemodialysis facilities varies considerably. While some states such as Colorado and New Jersey have requirements for hemodialysis facilities that practice reuse most others do not. The California proposed regulations for reprocessing and reuse of disposable hemodialysis filters, which have been referred to previously, is expected to be adopted shortly. In lieu of the AAMI or other National Standards many dialysis Networks and centers have developed their own protocols for reprocessing dialyzers for reuse. The quality and detail of these procedures probably varies as widely as the actual implementation. Networks with comprehensive well-developed guidelines include Networks 15 (Illinois) (82) and 7 (Upper Midwest) (83).

Ethical Considerations

Informed consent and freedom of choice in hemodialysis therapy has become as much of an issue as reuse itself. Many clinicians, the Renal Physicians Association and organizations such as National Medical Care argue that because there is no increase in risk associated with reuse, there is no warrant for any proposed requirement of a separate patient informed consent to reuse. They add that no other aspect of the dialysis process, or any other medical treatment, is singled out in this way. They believe that reuse, along with the dialysis prescription, brand of dialyzer, and type of dialysate, falls in the realm of the clinical judgment of the physician (Written Communication). If required to provide treatment to a patient who witholds consent to reuse, the clinician believes that this will improperly impute some special dangers or unproven status to reuse, a well-developed, well-understood and standard element in dialysis practice. Also, they note that multiple use of hemodialyzers can properly be implied in the consent for hemodialysis therapy in the same way that other methodologies are.

Those who feel that specific informed consent for use of reprocessed hemodialyzers is required maintain that differences in safety and efficacy do exist between reused dialyzers and first-use dialyzers. They believe that greater patient participation in the therapeutic process need not impair the physician's ability to deliver quality care and see such involvement as an assurance that quality care will remain the prime focus of such decisions. Because many facilities succeed with a voluntary participation in their reuse program, proponents of informed consent and freedom of choice take issues with the concern of clinicians that if one patient dictates their personal desires it could affect the program for the total patient group. Those who favor patient consent and choice argue that patients have been afforded these rights in the HCFA regulations of the ESRD program (84). They interpret section 405.2138 Condition: Patient's rights and responsibilities as the section of the law entitling patients in hemodialysis centers to informed consent and freedom of choice regarding the use of reprocessed dialyzers. This interpretation has been questioned by others.

The ethical issues in dialyzer reuse are extremely complex and have been approached at various levels. At the National Workshop on Reuse of Consumables in Hemodialysis held in Washington, D.C. in 1982, Caplan pointed out that reuse should be considered a moral issue because of the risks of reuse to the patient and its advantage to society (85). According to Caplan, in dialyzer reuse we have the protection of the rights of individual patients (choice) in circumstances where their rights might not coincide with the interests of society as a whole (cost containment). Caplan recommends that health professionals inform patients about dialyzer reuse and allow them to consent or not consent to this procedure, regardless the patient's choice is considered less than optimal therapy by the clinician (85).

The National Kidney Foundation in its Revised Standards for Reuse of hemodialyzers (1984) recommended patient informed consent for the reuse procedure as practiced by the center at which the patient is dialyzed (47). Moreover, they stated that any patient who does not consent to reuse, is entitled to a new dialyzer for his hemodialysis treatment. The state of California Department of Health Services has a similar statement in its proposed regulations regarding hemodialysis filters (49). Their regulations require a mechanism by which the patient is fully informed about his or her hemodialysis therapy, including the possibility of reuse of single use hemodialyzers. The regulation requires that the patients have full freedom of choice regarding the reuse of such dialyzers. The AAMI proposed guidelines for reuse and reprocessing of dialyzers do not address informed consent or freedom of choice because it was decided that this issue was not an appropriate area for an AAMI recommended practice (48).

Data from an informal OHTA telephone survey of ESRD Networks and a review of Network guidelines indicate that about 20 to 30 percent of the networks either lack guidelines for reuse or do not address this issue. Many Network guidelines address this issue by recommending a patient's right to information about the reprocessing procedure but do not recommend that a patient be given the right to refuse a reused dialyzer and choose a new dialyzer for each hemodialysis treatment. It appears that some Network guidelines (including those Networks that have adopted the NKF guidelines) recommend to the hemodialysis centers that patients are entitled to informed consent, the right to refuse and the right to a new dialyzer for each hemodialysis treatment. Networks which have included informed consent and patient choice in their guidelines to facilities that reprocess and reuse dialyzers include Networks 7 and 15.

Cost

The major stimulus for reuse and reprocessing is the potential for cost savings. Existing comparisons of the costs of single use versus reuse are subject to considerable uncertainty. Estimates of cost savings as a consequence of dialyzer reuse have ranged from $1,600 to $6,000 per patient per year, depending on the assumptions concerning dialyzer prices, labor costs, and reuse and reprocessing procedures. According to Romeo, the cost-savings of dialyzer reuse even with careful reprosessing procedure is in the order of $2,000 per patient year. With extensive reuse, savings nationally of 80-100 million dollars per year are estimated (2).

According to Romeo and Wagner, calculations of savings from reuse usually rely on a comparison of the cost of a new dialyzer with the cost per session if a dialyzer is reused (86). The factors involved include the price of a new dialyzer, the cost of reprocessing, the number of reuses, and the number of dialysis sessions per patient per year. According to the authors the estimate of cost savings is most sensitive to the price of the dialyzer. When the economics of dialyzer reuse were first being analyzed the cost of a dialyzer was about $20 to $25. Today a dialyzer, capable of reuse, can be purchased for about $13 to $15 (86). With the cost of a new dialyzer at $15, Lowrie has calculated a per treatment savings from reuse at about $11.00, if the dialyzer is reused an average 8 times (Written Communication). According to Goodship and colleagues a recent survey of dialyzer reuse in the United Kingdom showed that reuse in patients had declined from about 60 percent in 1981 to about 30 percent in 1985 (80). Goodship concluded that the decline in reuse was due to the reduction in the costs of dialyzers, the inconvenience of the reprocessing procedures and the time needed for its completion.

As noted above, the potential savings from dialyzer reuse is also sensitive to an accurate account of the costs of reprocessing. This cost has been difficult to determine because so many factors enter into its calculation, especially the appropriateness of the reprocessing procedure. The view has been expressed that reprocessing procedures, which currently vary, when standardized are likely to raise the current costs of reprocessing and thereby narrow, possibly significantly, the perceived savings of reuse (86). Lowrie, representing National Medical Care, Inc., has stated, for example, that California's proposed regulations contain numerous provisions which have the potential for increasing reuse program costs (Written Communication). He added that many facilities will be unable to absorb even a \$5-\$6 per treatment cost increase. According to the Department of Health Services, California's proposed regulations provide a maximum amount of patient protection with due consideration to state-of-the-art abilities of dialysis facilities to achieve the goals in the proposal (49). Moreover, it is believed that many of the centers practicing reuse have already implemented many appropriate reprocessing procedures.

A third factor in the cost calculations of reuse is the number of times the dialyzer is reused. According to Sadler, the greatest economy occurs with the first three reuses, with significant economic gains through at least eight (14). Lowrie reported that when the average number of uses is increased from 8 to 12 the additional cost savings were \$0.54 per treatment (Written Communication). Similar findings were reported by Bourke and associates after a detailed comparison of in vivo dialyzer performance after three, six, and 12 uses and a subsequent cost analysis (79). Bourke found a 50 percent reduction in dialyzer cost could be achieved by a policy of three uses, and a 62 percent reduction with a six-use policy. The investigators recommended six uses as optimum because continued use thereafter offered relatively minor cost advantages. The study also demonstrated that the hollow-fiber dialyzer could be used up to 12 times without any compromise in its performance (79). While the average reuse for a dialyzer may be six or seven times, many facilities will reuse a given dialyzer many more times to compensate for dialyzers that are replaced after fewer than six or seven uses.

Although there is little data on the reuse of blood lines, transducer filter, or dialyzer caps, it has been suggested that the reuse of blood lines is increasing. National Medical Care specifies reuse of dialyzers and blood lines in their dialysis facilities that practice reuse (Written Communication). According to a report by HIMA the advent of lowered reimbursement rates and increased costs associated with the treatment have not only brought about an increase in the reuse of dialyzers but blood lines and other ancillary hemodialysis devices as well (87). Recently, Banester showed that the reuse of blood lines, which cost about $4.00 a set in 1986 can result in significant cost-savings at those centers where reuse is practiced.

FINDINGS AND CONCLUSIONS

The reuse of hemodialysis devices labeled "for single use only" is a widespread practice in the United States. Over one-half of the 80,000 patients with ESRD are currently being dialyzed with reused dialyzers. It appears that in the majority of these patients, no significant difference in complication rate has been observed, yet adequate studies have not been performed to assure that facilities choosing to reuse, do so with optimal safety and clinical effectiveness.

I. The safe and effective reuse of hemodialyzers and blood tubing sets, transducer filters and dialyzer caps is dependent on the quality of the reprocessing. While voluntary hemodialyzer reprocessing guidelines have been proposed by Association for the Advancement of Medical Instrumentation (AAMI) and others, the degree to which they are adopted and implemented by dialysis centers varies. Little monitoring of reuse practices, techniques, or outcomes occurs. The literature indicates that many of the problems encountered, especially those that involve infectious complications, are due either to the lack of protocols, or to reprocessors not adhering to their own protocols or to following them incorrectly. There is a widely recognized need to develop guidelines for reprocessing in order to assure quality. Because proper reprocessing is critical to the outcome of reuse, standardizing the process in facilities in terms of standards for water quality washing, rinsing, disinfection should enhance the safety of the reuse process. Mechanisms for quality assurance, validation of procedures, and testing, are vital to assure optimal patient care. Although implementation of the proposed draft AAMI guidelines should improve patient care in many hemodialysis facilities that practice reprocessing and reuse, there are some issues on which the draft AAMI guidelines remain silent. These require attention. These include reuse and reprocessing of blood lines and tubing, transducer filters, and dialyzer caps. Disinfecting requirements and reprocessing effects on blood lines and tubing, transducer filters and dialyzer caps are not uniformly established. Whether these effects and requirements are different than for hollow fiber dialyzers is not well understood.

II. The greatest risk associated with reuse is that due to infectious complications. Although one CDC survey has indicated that the incidence of pyrogenic reactions (fever) is no greater in patients that reuse dialyzers, a number of recent outbreaks of bacteremia and sepsis have occurred in facilities practicing reuse. Patients have died as a result of outbreaks some of which are presently being investigated. The true incidence of bacteremia/sepsis is unknown since at the present time preliminary results from one inquiry suggests that there is underreporting of infectious complications and other problems associated with the reprocessing and reuse of hemodialyzers and blood tubing sets. There is no requirement that such complications be reported. Adequate dissemination of standards and monitoring of compliance is essential. Data exist by which to set parameters for determination of when the filter capacity of the dialyzer may be compromised as a result of reprocessing, but clinical correlations are lacking by which to assess patient outcomes.

III. The Code of Federal Regulations 21CFR Sec 820.3(k) defines a manufacturer as any person, including any repacker and/or relabeler, who manufactures, fabricates, assembles, or processes a finished device. 21CFR Sec 807.20(a)(3) states that individuals "who repackage or relabel a device" are required to register as manufacturers. On the other hand 21CFR 807.65(d) exempts "Licensed practitioner, including physicians, dentists, and optometrists, who manufacture or otherwise alter devices solely for use in their practice." No terminology specifically defines those who "reprocess" as a manufacturer. Therefore, it is unclear whether Good Manufacturing Practices could be required pursuant to 21 CFR 807.65(d). Although guidelines developed by AAMI have been in draft form for over four years they are yet to be adopted by that organization. Other guidelines have also been proposed by California and by several networks. The National Kidney Foundation has adopted its own guidelines for reprocessing, but these do not address blood tubing sets, transducer filters, dialyzer caps, or guidelines for informed consent or freedom of choice.

IV. No adequate clinical trials have been performed to address either the short- or long-term safety and efficacy of the practice of single versus multiple use of hemodialyzers, blood lines and tubing, transducer filters or dialyzer caps. It is known that residual formaldelyde or other disinfectants are retained in the dialyzers and tend to leach into the patient's blood during dialysis. In the case of formaldelyde, anti-N-like antibodies at formaldehyde doses greater than 10 ppm, blood coagulation disorders requiring high doses of heparin, neurological symptoms and other occurrences have been reported during or following dialysis. The clinical significance of these occurrences and their relationship to formaldehyde are not yet fully understood. Because of the concern regarding formaldehyde exposure, the AAMI recommendation for no more than 5 ppm residual needs to be reviewed. So does the concentration of formaldehyde necessary to adequately disinfect. The reuse of blood tubing sets, transducer filters, and dialyzer caps has not been addressed by any studies. Except for California where their use is allowed, no guidelines are proposed for their reprocessing or reuse. Multiple reuse is known to be associated with reduction in the filter volumes and clearance capacity of the dialyzer. Clinical correlations are needed to define efficacy of dialyzers following multiple use. Neither multiple use nor single use dialyzers are free of complications. Neither the actual incidence of first use syndrome nor the true morbidity and mortality associated with infections and other reuse-related complication are well documented. No prospective controlled trials have compared the relative frequency of these complications in either setting.

V. The ethical issues in hemodialyzer reuse involve informed consent and freedom of choice. 42CFR405.2138 (a) and (b) provide that ESRD patients should be fully informed and be provided an opportunity to participate in the planning of their treatment. While some facilities which reuse dialyzers provide informed consent and freedom of choice as part of their protocol others do not. The amount of information provided as well as patient options afforded may vary considerably among centers. The National Kidney Foundation's Revised Standards for Reuse of hemodialyzers specifies that facilities that practice reprocessing of dialyzers should provide informed consent and freedom of choice, but no guidance is provided as to how to accomplish this. Other proposed guidelines, except for California's, provide no input in these areas. There are no validated clinical indicators for when reuse is appropriate. Neither are risk-benefit equations available for assisting patients in the understanding of their choices.

VI. While the cost of single use has dropped dramatically, mostly due to reduction in in the cost of filters over the last decade, there still exist economies of scale for large centers that practice reuse. It is clearly cost effective for large centers that practice reuse to reprocess filters. For smaller centers the benefits of reprocessing are less obvious since similar economies of scale are difficult to realize. While some suggest that existing modes of payment and periodic reductions in payment rates for ESRD promote greater reuse, such causal relationships are not fully established. Centers that practice reuse indicate that the primary incentive is economic as well as concern about first use syndrome. Other areas in which cost-savings are realized by dialysis facilities include reduction in testing, validation, training and then laxity in safety standards (87).

VII. Data generated to date by in vitro studies (i.e., The Deane Report) surveys, registries, and other methods short of clinical trials, have been evaluated. Those studies have generally been either retrospective or of a non-clinical nature. Questionnaires designed for purposes other than the study of reuse, as is the case with both the Tri-State study and the proposed HCFA, NIH registries are currently in use. MMWR recently noted that there is also a need for additional clinical studies to address the safety and efficacy of reuse of hemodialyzers. No adequately designed study has been performed to definitively address the long-term safety either of reusing hemodialyzers or of intravenous exposure to formaldehyde.

The purpose of this assessment is to define the state-of-the-art of reuse of hemodialysis devices labeled by the manufacturer "for single use only;" to synthesize available information on the subject; and to identify existing problems as well as areas in need of further research and/or Public Health Service action. While an exhaustive analysis of available data was completed, additional information will continue to become available as these issues are further addressed. Therfore, this assessment may require revision and updating.

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[NOTE: THIS WAS THE FINAL SET OF RECOMMENDATIONS FORWARDED TO THE ASSISTANT SECRETARY FOR HEALTH BY NHCSR.]

RECOMMENDATION	RESPONSIBILE AGENCY
I. STANDARDS DEVELOPMENT	CDC
A. Empirically based standards are necessary for: 1. water quality 2. disinfectants 3. appropriate mode and conditions of use 4. residue exposure and toxicity 5. risk exposure for staff 6. effect on hemodialyzer membranes 7. effect on blood lines and tubing, transducers and filter caps	
B. Prepare guidelines for transmittal to HCFA which will permit HCFA to revise conditions of participation and instructions to State survey agencies	
II. EVALUATE RELATIVE MORBIDITY/MORTALITY	CDC
A. Infectious complications B. Non-infectious complications C. Other adverse reactions	
III. REPROCESSING	FDA
A. Apply Good Manufacturing Practices 1. dialyzers 2. other components	
B. Develop monitoring program for joint application through HCFA instructions to State Survey contractors and program participation conditions	
C. Performance assesment testing program for frequency of reuse 1. volume 2. pressure 3. clearance	
IV. CLINICAL STUDIES	NIH
A. Determination of clinical indicators for 1. single use 2. multiple use	

RECOMMENDATION — RESPONSIBLE AGENCY

B. Ascertain significance of residual disinfectant levels for

1. Anti-N-like antibodies
2. clotting/heparin
3. other toxicities

V. EDUCATIONAL MATERIAL — NIH

A. Support a Consensus Conference to provide educational material for the dialysis community on the indications and implications for single versus multple use of dialyzers and associated components

B. Develop educational material suitable for use by patients in understanding implications of single versus multiple use.

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[NOTE: THIS IS AN EARLIER DRAFT OF THE NCHSR/OHTA RECOMMENDATIONS BASED ON ITS ASSESSMENT REPORT.]

RECOMMENDATIONS	RESPONSIBLE AGENCY
I. Standards and/or Guidelines should be Adopted for the Safe and Efficacious Reprocessing of Hemodialyzers	
A. Reprocessing	FDA
1. Washing	
2. Cleansing	
3. Rinsing	
4. Water quality	
B. Disinfecting	CDC&FDA
1. Optimal disinfectant(s)	
2. Efficacy	
3. Appropriate mode and conditions of use	
4. Residue exposure and toxicity	
5. Short/long-term risks to patients and staff	
6. Effect on hemodialyzer membranes	
7. Dialyser Filters	
8. Blood tubing, transducer filters and dialyzer caps	
II. Studies Should be Conducted in the Area of and Regarding Methods of Infection Control	
A. Outbreaks of bacteremia/sepsis	CDC
1. Past and present outbreaks	
2. Status of ongoing surveillance practices/results	
3. Existing standards/guidelines	
4. Status of field monitoring of dialysis facilities	
B. Results of CDC/FDA investigations	CDC&FDA
1. RenNew-D	
2. Renalin	
III. Policy Definition May be Appropriate in the Area of GMP versus Voluntary Standards and should Address:	
A. Definition of manufacturer (CFR21)	FDA
B. GMP in reprocessing	FDA
C. Status of exising and other guidelines	FDA
1. AAMI	
2. California	
3. National Kidney Foundation	
4. Networks	

D. Suitability of specific components for reuse (blood lines, tubing, transducer caps and filters) (CFR21)	FDA
E. Performance assessment testing	FDA
1. Volume 2. Pressure 3. Clearance 4. Optimal number of reuses	
F. Reuse frequency	FDA
IV. Other Studies are Needed:	
A. To determine if the reuse of hemodialyzers are safe when compared to single use and to identify advantages/disadvantages associated with this practice	NIH
B. To establish safety of formaldehyde/other disinfectants and other solutions when administered intravenously	NIH/CDC/FDA?
1. Significance of residual levels 2. Anti-N-like antibodies 3. Other toxicities 4. Clotting/heparin	
C. To determine the clinical efficacy of reprocessed, reused dialyzers	NIH/FDA
1. Patient clinical parameters	
D. To evaluate the morbidity and mortality associated with reuse versus single use	NIH/CDC
1. Infectious complications 2. Noninfectious complications 3. Other adverse reactions (FDA)	
E. Guidelines may be appropriate to address other factors affecting safety of reuse	FDA/NIH
V. Guidelines May Be Appropriate To Address Ethical Considerations Pertaining To:	
A. Informed consent. Model procedures (i.e., California) should be considered for adoption	HCFA
B. Freedom of choice	HCFA
1. Alternatives o Single use, CAPD, transplantation, etc	

VI.	Cost	NCHSR/HCFA
	A. Single use	
	B. Reprocessing	
VII.	Nonclinical Studies Reliance on existing or ongong studies should be tempered by the knowledge that they have been designed for purposes other than evaluating reuse. These registries will be using data that already exist in the HCFA data base. No new information will be generated. It is recommended that plans be initiated to develop new information specifically applicable to the reuse of hemodialyzers for the purpose of conducting studies through:	
	A. Registry	HCFA
	B. HCFA/CDC surveys	HCFA/CDC

[NOTE: THIS IS AN EARLIER DRAFT OF THE NCHSR/OHTA RECOMMENDATIONS BASED ON ITS ASSESSMENT REPORT.]

AUG 5 1986

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RECOMMENDATIONS	RESPONSIBLE AGENCY
I. Standards and/or Guidelines should be Adopted for the Safe and Efficacious Reprocessing of Hemodialyzers	
A. Reprocessing	FDA
1. Washing 2. Cleansing 3. Rinsing 4. Water quality	
B. Disinfecting	CDC&FDA
1. Optimal disinfectant(s) 2. Efficacy 3. Appropriate mode and conditions of use 4. Residue exposure and toxicity 5. Short/long-term risks to patients and staff 6. Effect on hemodialyzer membranes 7. Dialyser Filters 8. Blood tubing, transducer filters and dialyzer caps	
II. Studies Should be Conducted in the Area of and Regarding Methods of Infection Control	
A. Outbreaks of bacteremia/sepsis	CDC
1. Past and present outbreaks 2. Status of ongoing surveillance practices/results 3. Existing standards/guidelines 4. Status of field monitoring of dialysis facilities	
B. Results of CDC/FDA investigations	CDC&FDA
1. RenNew-D 2. Renalin	
III. Policy Definition May be Appropriate in the Area of GMP versus Voluntary Standards and should Address:	
A. Definition of manufacturer (CFR21)	FDA
B. GMP in reprocessing	FDA
C. Status of exising and other guidelines	FDA
1. AAMI 2. California 3. National Kidney Foundation 4. Networks	

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	D. Suitability of specific components for reuse (blood lines, tubing, transducer caps and filters) (CFR21)	FDA
	E. Performance assessment testing	FDA
	1. Volume	
	2. Pressure	
	3. Clearance	
	F. Reuse frequency	FDA
	1. Optimal number of reuses	
IV.	Other Studies are Needed:	
	A. To determine if the reuse of hemodialyzers are safe when compared to single use and to identify advantages/disadvantages associated with this practice	NIH
	B. To establish safety of formaldehyde/other disinfectants and other solutions when administered intravenously	NIH/CDC/FDA?
	1. Significance of residual levels	
	2. Anti-N-like antibodies	
	3. Other toxicities	
	4. Clotting/heparin	
	C. To determine the clinical efficacy of reprocessed, reused dialyzers	NIH/FDA
	1. Patient clinical parameters	
	D. To evaluate the morbidity and mortality associated with reuse versus single use	NIH/CDC
	1. Infectious complications	
	2. Noninfectious complications	
	3. Other adverse reactions (FDA)	
	E. Guidelines may be appropriate to address other factors affecting safety of reuse	FDA/NIH
V.	Guidelines May Be Appropriate To Address Ethical Considerations Pertaining To:	
	A. Informed consent. Model procedures (i.e., California) should be considered for adoption	HCFA
	B. Freedom of choice	HCFA
	1. Alternatives o Single use, CAPD, transplantation, etc	

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V.	Guidelines May Be Appropriate To Address Ethical Considerations Pertaining To:	
	A. Informed consent. Model procedures (i.e., California) should be considered for adoption	HCFA
	B. Freedom of choice	HCFA
	1. Alternatives o Single use, CAPD, transplantation, etc	
VI.	Cost	NCHSR/HCFA
	A. Single use	
	B. Reprocessing	
VII.	Nonclinical Studies Reliance on existing or ongong studies should be tempered by the knowledge that they have been designed for purposes other than evaluating reuse. These registries will be using data that already exist in the HCFA data base. No new information will be generated. It is recommended that plans be initiated to develop new information specifically applicable to the reuse of hemodialyzers for the purpose of conducting studies through:	
	A. Registry	HCFA
	B. HCFA/CDC surveys	HCFA/CDC

DEPARTMENT OF HEALTH & HUMAN SERVICES

Memorandum

Date August 11, 1986

From Assistant Secretary for Health

Subject Reuse of Hemodialyzer Devices Labelled for "Single Use Only"

To Administrator, Health Care Financing Administration

The attached technology assessment on the above subject has been completed by the National Center for Health Services Research and Health Care Technology Assessment (NCHSR/HCTA). In preparing this assessment, NCHSR/HCTA consulted with the NIH, CDC and FDA. It also reviewed the literature and considered the comments and information received as a result of a Federal Register notice published April 10, 1986. As additional information is identified or becomes available, NCHSR/HCTA will update and reevaluate its assessment as appropriate.

The findings to date indicate that when physicians and facilities exercise appropriate quality control over reprocessing of dialyzers, and adequate disinfecting, washing and rinsing of related components is practiced, patient outcomes appear to be no different in facilities that reuse dialyzers than for those facilities where single use is the normal operating mode. While there is evidence of a relationship between improper reprocessing and outbreaks of bacteremia/sepsis, these appear to represent isolated events. The absence of reported increases in the morbidity and mortality given increased practice of reuse suggests that virtually all facilities are following adequate procedures. The assessment also found variation in the reprocessing practices and concludes that the need exists for further study from which, if indicated, additional guidelines can be developed to assure optimal safety and clinical efficacy of dialysis, whether under single use or multiple use conditions.

I have requested NIH, CDC, and FDA to review the assessment's findings and report back to me on appropriate courses of action. The objective of these follow-up actions is to develop and provide information which will be helpful to dialysis facilities and patients in understanding the risks and benefits of single versus multiple use of dialyzers and related components.

/s/ Robert E. Windom
Robert E. Windom, M.D.

Attachment

DEPARTMENT OF HEALTH & HUMAN SERVICES

Public Health Service
National Institutes of Health

Memorandum

Date August 12, 1986

From Director, NIH

Subject NCHSR/HCTA Assessment Report on Dialyzer Reuse--BRIEFING

To Robert E. Windom, M.D.
The Assistant Secretary for Health

Attached is a briefing paper I have asked the National Institute of Diabetes and Digestive and Kidney Diseases to prepare in response to your request that FDA, CDC and NIH review the NCHSR/HCTA assessment and report to you on appropriate courses of action.

James B. Wyngaarden
James B. Wyngaarden, M.D.

Attachment

93/97

TRACER

NATIONAL INSTITUTE OF DIABETES AND DIGESTIVE AND KIDNEY DISEASES

Briefing Paper on NIH Response to Technology Assessment Report on Dialyzer Reuse

BACKGROUND

On August 6, 1986, the Director of the National Center for Health Services Research and Health Care Technology Assessment (NCHSR/HCTA) transmitted to the Assistant Secretary for Health a report on an "Assessment of Medical Technology: Reuse of Hemodialysis Devices Labeled for Single Use Only." NIDDK has reviewed the biomedical research questions raised in the report and has found that they can be most appropriately addressed via epidemiological studies. NIDDK has concluded that its current initiative to establish a Consolidated ESRD Data System offers a unique and highly promising means of responding to many of the data needs identified in the report.

CONSOLIDATED ESRD DATA SYSTEM

Attached at Tab A is the draft solicitation (Request for Proposals) to effect the Consolidated ESRD Data System. As noted in the draft, this initiative is fully developed, with an anticipated announcement date of September, 1986, and an anticipated contract award date of April, 1987. This initiative is an outgrowth of an existing interagency agreement which NIDDK and the Health Care Financing Administration (HCFA) entered into in October, 1985 (also attached at Tab A).

The NIDDK considers this initiative to be a landmark undertaking that will enable the Public Health Service and HCFA to address a wide range of important research and clinical issues pertaining to ESRD. The size, scientific scope and organizational framework of the Consolidated ESRD Data System are quite different from that of limited patient registries that have been established for other categorical diseases. The following review of some of the salient features of the ESRD Data System demonstrates the ways in which it will provide a major contribution to increased understanding of ESRD and to improved therapeutic approaches to aid patients and their families.

MOST EFFECTIVE SCIENTIFIC APPROACH FOR ADDRESSING POTENTIAL SHORT- AND LONG-TERM HEALTH RISKS OF DIALYZER REUSE

NIDDK considers the Consolidated ESRD Data System to be the most effective and efficient scientific approach for addressing concerns about the potential short- and long-term health risks of dialyzer reuse.

- Short-Term Health Risks: It is known that patients treated with improperly reprocessed dialyzers are at increased risk for bacteremia. Likewise, patients treated with reused dialyzers that have been disinfected with formaldehyde are at increased risk for developing anti-nuclear-like antibodies, although the long-term clinical significance of this is not yet clear. Formaldehyde has also been shown to be an inhibitor of the anticoagulant, heparin, although this has not been a serious complication in current use. What is not clear is what hypothesis regarding the short-term health risks of hemodialysis could be meaningfully tested in clinical studies, given the current level of knowledge. With the information to be gained through the Consolidated ESRD Data System, an appropriate hypothesis or hypotheses may be framed and appropriate studies designed.

- Long-Term Health Risks: NIDDK believes that long-term health issues can be addressed most effectively through long-term, careful analyses of health data derived from patients on dialysis, through the Consolidated ESRD Data System. This approach is the accepted methodology for measuring long-term health risks such as toxicity.

  Retrospective analyses of mortality and morbidity associated with dialyzer reuse strongly suggest that any possible long-term health risks of reuse are probably a very low-incidence phenomenon. Such phenomena are most appropriately studied through an epidemiologic approach, such as that on which the Consolidated ESRD Data System is predicated. For example, one of the variables to be measured in the Consolidated ESRD Data System is the development of carcinoma. The Data System will permit a comparison of the outcome of patients who have used reprocessed dialyzers with those who have not.

  A long-term prospective clinical trial on dialyzer reuse would probably not be feasible. It should be noted, for example, that approximately 15-20 percent of the ESRD patient population is annually lost to follow-up, making a long-term clinical trial involving low-incidence phenomena particularly difficult. With this type of drop-out rate, the number of ESRD patients who would have to be randomized to show a difference in a low-frequency occurrence such as carcinogenesis would be astronomical.

COMPREHENSIVE DATA

The ESRD Data System will provide the first consolidation of data on all types of ESRD patients, including those undergoing hemodialysis, continuous ambulatory peritoneal dialysis, and transplantation. It will contain types of data which are currently not collected at all or are collected in only a limited way, including data on the etiology of the underlying renal disease, methods of patient treatment and associated patient outcomes, and complications of treatment. As such, the new ESRD Data System will enable tracking of patients through multiple therapies and some comparison of the effectiveness and complications of dialysis and transplantation.

MECHANISM FOR PROSPECTIVE CLINICAL STUDIES

Unlike many other databases or patient registries, the Consolidated ESRD Data System described in the attached RFP (pp. 4-5) will identify scientific problems and provide opportunities for more focused investigation. It will provide appropriate selected national samples of patients to permit clinical studies leading to conclusions that may be generalizable for the national formulation of prescribed treatments. Examples include: (a) well delineated prospective studies of reuse of dialyzers; (b) surveillance for the appearance of malignancies in ESRD patients and for possible cause-effect relationships; (c) studies of the genesis and causes of ESRD; and (d) elucidation of complications resulting from treatment interventions.

Clearly, examples (a), (b) and (d) cited previously are directly responsive to issues raised in the NCHSR/HCTA report concerning the safety of dialyzeer reuse and, particularly, disinfectants used in reprocessing (that is, issues of bacterial infections and possible toxicities).

The new Consolidated ESRD Data System will provide a mechanism for (1) the actual conduct of appropriate prospective clinical studies and (2) the identification of clinical studies which NIDDK may determine should be pursued through either ancillary studies or through separate research solicitations (Request for Proposals or Request for Applications). It should be noted that NIDDK already supports a Continuous Ambulatory Peritoneal Dialysis (CAPD) Registry through which four prospective clinical studies are currently being pursued. This registry (which will be subsumed under the new Consolidated ESRD Data System) thus provides a working model of the successful integration of prospective clinical studies within an epidemiologic research mechanism.

ORGANIZATIONAL FRAMEWORK

As noted in the attached draft RFP (pp. 7-8), the initiative for the new Consolidated ESRD Data System will benefit from the insights and recommendations of the following leading societies and major specialty organizations:

- American Society of Nephrology (ASN)
- American Society of Pediatric Nephrology (ASPN)
- American Society of Transplant Surgeons (ASTS)
- American Society of Transplant Physicians (ASTP)
- American Society of Artificial Internal Organs (ASAIO)
- National Kidney Foundation (NKF)
- Renal Physicians Association (RPA)
- Organ Procurement and Transplant Network
- Network Forum
- National Association of Patients on Dialysis and Transplantation (NAPHT)
- American Nursing Association (ANA)

The Consolidated ESRD Data System will be guided by three committees of experts: (1) a Steering and Planning Committee, (2) a Monitoring Committee, and (3) an External Advisory Group. In designing this framework, the NIDDK has made every effort to ensure that expertise from all components of the kidney community is brought to bear on the development of the Consolidated ESRD Data System.

Central to the Consolidated ESRD Data System will be a Coordinating Center, which will have responsibility for developing and implementing systems for data collection, editing, processing; designing data validation methodology; execution of designed protocols; and biostatistical analysis and reporting--as well as for performing a variety of other functions critical to the integrity and utility of the Data System. The role of the Coordinating Center is described more fully in the attached RFP (p. 6).

ADVICE TO HCFA

A stated objective of the Public Health Service is to provide HCFA with advice with respect to criteria which will assist State Survey Agencies in their monitoring of the ESRD program, and to provide information which will be helpful to dialysis facilities as they develop and revise operating procedures. The Consolidated ESRD Data System should be particularly helpful in this regard since it emanates from an interagency agreement between NIDDK and HCFA which is intended to provide information concerning the genesis, complications, and treatment of ESRD in the United States in order to meet the needs of both agencies, as well as those of the nephrology and transplantation communities.

SUMMARY

The Consolidated ESRD Data System which NIDDK is initiating offers an unprecedented opportunity for acquiring information vital to answering the many research questions surrounding ESRD, including short- and long-term health issues of dialyzer reuse. The broad scope of the Data System, its advisory framework, its ability to incorporate prospective clinical studies on appropriate subsets of the ESRD patient population, and its integral relationship with HCFA make it a unique undertaking of exceptional promise. As such, it is considered the most appropriate NIH response to biomedical research issues raised in the NCHSR/HCTA assessment report on dialyzer reuse.

STATE OF CALIFORNIA—HEALTH AND WELFARE AGENCY
GEORGE DEUKMEJIAN Governor

DEPARTMENT OF HEALTH SERVICES
714/744 P STREET
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August 12, 1986

Claudia J. Woodring
Contracting Officer
State Contracts and Assistance
  Agreements Branch, HFA-521
Food and Drug Administration
Rockville, Maryland 20857

Attn: Mary O'Neil

Dear Ms. Woodring:

CONTRACT 223-84-4276

Enclosed are five (5) copies of the draft final report for the subject contract, "State Participation in Dialysis Systems Investigation". Sections dealing with the home patient portion of the study, and blood circuit monitoring equipment will be forwarded within two weeks in a supplement to this report. Please call me if there are any questions.

Sincerely,

Stuart E. Richardson, Jr., Chief
Food and Drug Branch

James Barquest

James Barquest, Ph.D.
Biomedical Engineer

Enclosure

DRAFT

CALIFORNIA DIALYSIS FACILITY STUDY

(PRELIMINARY DRAFT REPORT)

AUGUST 1986

FOOD AND DRUG ADMINISTRATION

DEPARTMENT OF HEALTH, EDUCATION, AND WELFARE

CONTRACT # 223-84-4276

This preliminary draft report is the result of a study by the Device Program, Food and Drug Branch, California Department of Health Services developed under a Food and Drug Administration contract to determine the current use of hemodialysis equipment in California. The contents, including results, conclusions, and recommendations, contained herein are preliminary and subject to change pending further review by the Department and assessment by the Food and Drug Administration. This report is intended for discussion only and may not be referenced; any distribution of this draft report or portions of it must contain this disclaimer. Further information regarding this report may be obtained by contacting:

Lawrence Kobren
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Contract Title: State Participation in Dialysis System Investigation

Contract #: 223-84-4276

Organization: Device Program
Food and Drug Branch
California Department of Health Services
714 P Street, Room 400
Sacramento, California 95814

Date of Participation: September 1984

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The use of trade names in this document does not imply endorsement of products by the California Department of Health Services nor the Food and Drug Administration.

CALIFORNIA DIALYSIS FACILITY STUDY

(PRELIMINARY DRAFT REPORT)

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1 Dialysis Facility Site Questionnaire

2 California Chloramine Standards

3 Proposed California Hemodialyzer Reuse Regulations

INTRODUCTION

The data contained in this report consist of oral and written information voluntarily provided by dialysis facilities during site visits to thirty-one dialysis units and ten home dialysis patients. Verbal data are reported as relayed to the study teams by the persons interviewed. All data were reviewed for inconsistencies and clarification sought as needed, but no attempts were made to independently verify accuracy through the review of facility records other than those voluntarily provided, or through other sources. In some instances, data gaps appear because the persons interviewed did not have, or could not locate, the desired information.

Interviews were primarily with dialysis technicians, with input from others as required. Facility cooperation in providing information was generally good; however, some facilities were obviously unprepared for the study team even though copies of the data collection forms were provided in advance. The data from these facilities are generally less complete than from the other facilities.

During the site visits, one member of the two person study team would interview facility staff while the other would examine equipment, and review manuals and labels. During the interview period, each data sheet item was discussed. Copies of written procedures, log sheets, etc. were obtained whenever possible to support data sheet information; however, in the absence of supporting documentation the data sheet items were completed based on the verbal response of those interviewed, and the observations of study team.

In tabulating the data, efforts were made to resolve apparent conflicting information through follow-up phone calls. In the event of conflict between verbal and written information (eg. a maintenance log), preference was given to the written data.

The thirty-one facilities included in the study consist of eleven hospital-based and twenty free standing units. They represent a little less than one-fifth of the licensed California facilities. Candidates for the study were randomly selected. Those selected as candidates were contacted and requested to participate in the study. Those ultimately selected for participation were selected from the candidate list based on willingness to participate, access to study teams, and ownership. Participation by facilities with the same ownership was limited to two. The selection process was therefore was not completely random, but it is felt that the subject facilities comprise a sufficiently representative sample to allow the identification of general trends and areas for further study. We would not recommend basing any regulatory or standard setting activity on these results alone.

Some statistical information regarding facility size and patient load are presented in Table II.

California Dialysis Facility Study

WATER TREATMENT SECTION

Introduction

This portion of the study is a review of the equipment used to treat the water used for preparation of the dialysate. In each facility, the following data were obtained:

(1) Type and configuration of equipment in use (e.g., reverse osmosis, deionization, etc);

(2) Conformance with equipment label requirements, equipment features, and facility practices recommended in the American National Standard for Hemodialysis Systems (ANSI/AAMI RD5-1981);

(3) Water quality standards in use;

(4) Water system validation;

(5) Control measures employed to assure that product water consistently meets or exceeds the quality standards in use:

  (a) Source water monitoring,

  (b) Product water monitoring,

  (c) System parameter monitoring,

  (d) Maintenance and calibration procedures.

Samples of the data sheets used during the site visits are contained in Appendix 1. Specific findings are presented in the following sections. When applicable, findings are contrasted with existing state or local requirements or the American National Standard for Hemodialysis Systems, ANSI/AAMI RD5-1981.

Equipment Summary

The type of equipment in place in each facility is summarized in Table W1. Table entries include reverse osmosis systems (RO), deionization systems (DI), carbon filters (CF), softeners (S), sediment filters (SF), carbon fines filters (FI), bacterial filters (BA), and other systems not explicitly categorized (O). Equipment included in the "O" category include ultraviolet disinfection systems and colloid filters. Colloid filters are ion exchange devices which replace high molecular weight organics and silts with chloride ions. Bacterial filters are those with less than 1 micron pore size.

All but two of the thirty-one subject facilities have reverse osmosis units in place. One of the two, a four station hospital based pediatric unit, has no water treatment equipment in place at all except for a 5 micron filter on each dialysis machine, but is planning the installation of an RO system. The other facility without an RO system is a six-station hospital based unit which only dialyzes acute and unstable chronic patients. This facility employs a carbon filter followed by a deionizer to prepare water for dialysis.

Seven facilities have deionization systems in place; two of these use the DI as back-up for use only when the RO unit is not in service. Four facilities have their DI units placed downstream of the RO to polish the RO product water. One facility utilizes DI as their primary means of water treatment.

Twenty-seven facilities soften their water prior to further treatment. Hospital based units normally are supplied with water which is softened at a central location for use throughout the hospital.

Twenty-seven of the facilities utilize carbon filters. Carbon filtration is required in California where chloramines are present in the feed water (see Appendix 2); however, many facilities utilize carbon filtration even when chloramines are not present to remove chlorine and organic materials. In those units utilizing both carbon filters and reverse osmosis, the carbon filters and a filter for removing carbon fines are normally placed upstream of the RO unit, although two facilities utilizing this placement do not employ fines filters. These two facilities do not report any problems with fouling of their RO units, however. In those facilities with carbon filters downstream from the RO units, the carbon filters are followed by sediment filters to remove fines, submicron filtration and, in one case, a UV disinfection unit.

Twelve of the facilities employ submicron filtration for the control of bacteria.

Twenty eight of the units employ sediment filters (greater than or equal to one micron pore size) in their water treatment systems. These are normally used as an initial filter for feed water, to remove carbon fines, or as an RO prefilter.

Ten facilities have water storage tanks incorporated into their water systems; each treats the stored water with either UV disinfection, submicron filtration, or both, prior to use.

Nine units recirculate unused product water from the points of use back into the treatment system for subsequent storage and/or reprocessing. Seven of these return the unused product water to a storage tank where it must undergo submicron filtration and/or UV disinfection prior to re-delivery to the points of use. Two of the facilities mix the unused product water with the RO feed water for retreatment. Backflow prevention devices (checkvalves) were observed to be in place to prevent retrograde flow of potentially contaminated water to the point(s) of use.

It is difficult to comment on the adequacy of the systems reviewed during this study based on system configuration alone. Certain obvious considerations such as the existence of carbon fines filters, necessary RO pretreatment, carbon filtration for chloramine removal, bacteriological controls, and system qualification or validation will be discussed in subsequent sections.

Conclusions/recommendations - Equipment Summary

Reverse osmosis appears to be the preferred method of water treatment in the dialysis facilities included in the study. Four of the twenty-nine facilities utilizing RO also use DI and softening for water treatment. Only two of the facilities utilizing RO do not pre-soften their water before further treatment. One facility employs DI as their primary treatment method, and one facility does not treat their water at all.

Personnel at both facilities not equipped with RO systems indicated that they are considering the installation of an RO system although neither facility reports experiencing any problems directly attributable to inadequate water treatment. Two facilities with recently installed RO systems, however, indicated that they had upgraded their respective systems to include RO because of unacceptable contaminant levels.

Storage tanks are employed when the water system output is not sufficient to satisfy peak demand periods. Those facilities utilizing storage tanks seem generally aware of the increased risk of bacterial growth associated with water storage, but do not generally employ increased monitoring for bacterial growth, nor do they employ more rigorous disinfection schedules. Submicron filtration and UV disinfection are not the most effective methods of controlling bacterial levels. In view of the increased risk of bacterial proliferation associated with water storage, facilities are advised that higher levels of monitoring and disinfection may be appropriate.

Equipment characteristics

Label statements, device features, and facility practices were reviewed for conformance with the requirements for water treatment equipment listed in the American National Standard for Hemodialysis Systems, ANSI/AAMI RD-5 1981.

The water systems in place are primarily "custom" installations consisting of various components permanently installed by the water system vendor. The component parts are normally general purpose components not labeled for any specific application. The water system vendor assembles these components into a system configuration specifically for the preparation of water for dialysis. The vendor then becomes the medical device manufacturer, although most also provide water systems for a variety of industrial and residential applications. The results reported here represent only about seven different suppliers or vendors but numerous original equipment manufacturer (OEM) products.

A. Reverse Osmosis Systems

The findings for twenty-nine RO systems are listed in Table W2. The information contained on product labels is minimal. The manufacturer's name and address, the trade name and device type, and the model and serial number of the device failed to appear on the product labels over thirty percent of the time. Frequently, the name of the component manufacturer appeared on the label rather than, or in addition to, the name of the vendor. Warnings regarding reading the product literature and the removal of substances which could adversely affect the membrane were rarely provided. Fittings and connections were seldom marked or otherwise identified. Many systems are permanently installed units, however, with servicing performed by the supplier so that facility personnel probably do not require identification of fittings. In such cases a N/A response was entered. In those instances where facility personnel require fitting identification, a Y or N response was entered as appropriate.

Sixteen of the systems provide continuous monitoring of both RO feed and RO product water conductivity. None of the facilities explicitly impose a requirement that the salt passage rate not exceed two times that at initial equipment qualification, although such a requirement may be implicit in a minimum allowable rejection rate specification depending on the original rejection rate.

Thirteen of the systems have alarms in place which are activated when the rejection rate falls below a preset level. Facility practices vary with respect to how these are used. One facility purposefully sets the alarm limit at a low setting to avoid "nuisance" alarms. Another has the capability of setting the monitor to read either feed water conductivity, product water conductivity, or rejection rate and chooses to leave the monitor in the "product conductivity" position so that product conductivity is read but the rejection rate alarm feature is defeated.

In general, facilities appear to have sufficient pretreatment provisions in place to minimize damage to the RO membrane due to the contaminants specified on the data collection forms. In those instances where an N/A response appears, facility personnel have indicated that pretreatment is not applicable. Where an N response appears, no pretreatment is performed, but facility personnel were not certain whether pretreatment is necessary or not.

Discussion/Recommendations - RO Systems

Conformance with product label requirements was found to be minimal for most water treatment equipment. The rationale provided in the AAMI standard (ANSI/AAMI RD-5 1981) for the labeling of water treatment equipment with the name and address of the manufacturer, identification of the device, appropriate warnings, etc., cannot be disputed. It appears, however, that the benefit to be derived from the labeling requirements may vary with the circumstances under which the water system is installed, used, and maintained. The water systems in place in the subject facilities ranged from those installed by a vendor with little or no subsequent involvement by the vendor, to those in which the vendor assumed a major role in maintaining the system after installation. In the latter case, "adequate" labeling may be different than in the former case.

It does not appear that it is standard practice to regularly monitor rejection rate. Facilities not measuring rejection rate tend to rely on product water conductivity monitoring, measurement of reject and permeate flow rates, and system pressure readings to evaluate RO performance. Rejection rate, however, is a more direct measurement of RO system performance which normalizes for fluctuations in feed water conductivity and should be monitored. Facilities are urged to include rejection rate monitoring capability with an appropriate alarm as a system specification.

B. Carbon Filters

The data on carbon filters is given in Table W3. The labeling results for RO systems and subsequent comments are generally applicable to carbon filters and will not be repeated.

Approximately half of the facilities utilizing a replacement service for their carbon filters do not have specific procedures in place to avoid the return of filters contaminated by non-medical users. Those entries with question marks indicate facilities which did not know whether their vendor routinely segregates the filters returned from their medical users. Approximately half of the facilities utilizing a replacement service do not have specific provisions for disinfection of returned units. Again, question mark entries indicate facilities which were not sure. All but one of the facilities utilizing carbon filters have filters in place for the removal of carbon fines.

Discussion/Recommendations - Carbon Filters

A potential problem associated with the use of carbon filters in the facilities visited appears to be failure to provide adequate measures to ensure that units regenerated off-site are free of industrial contaminants and are disinfected prior to being placed in service. The California guidelines for carbon filtration (Appendix 2) discuss control measures for the problem of bacterial growth on carbon filter media but do not cover possible contamination by non-medical users. Facilities utilizing carbon filter media which are regenerated off-site are advised to check with their vendor to ensure that they do not receive "non-medical" filter media. Facilities should also take steps to ensure that units are adequately disinfected and properly rinsed of disinfecting agents prior to being placed into service, since the introduction of avoidable bacterial or other contamination represents an unnecessary challenge to the system regardless of any downstream control measures employed.

C. Sediment Filters

The data on sediment filters is listed in Table W4. Labeling results are similar to those discussed under RO systems. Twenty-six of the twenty-nine facilities utilizing sediment filters have opaque filter housings for the prevention of algae growth.

Discussion/Recommendations - Sediment Filters

No significant problems were observed with respect to the use of sediment filters, although those facilities not employing opaque filter housings should be aware of the potential for algae proliferation.

D. Deionization (DI) Systems

The data for deionization systems is listed in Table W5. The product label findings are similar to those discussed under RO systems. All eight of the DI units in place have continuous resistivity monitoring of product water to ensure a resistivity level of 1 Megohm-cm or greater. Two of the facilities did not know whether their resistivity monitors are temperature compensated; the remaining six have temperature compensation. Audible resistivity alarms are in place at four facilities; the remaining four rely on either "DI lights", or a meter reading. Seven of the eight facilities have carbon filters upstream of the DI units to preclude nitrosamine formation. Six units utilize an exchange tank service for their DI units. Four of the six have no procedures in place to prevent the installation of tanks previously contaminated by non-medical users; one facility was not sure. Four of the six provide for the disinfection of regenerated units, and two indicated they were not sure.

Discussion/Recommendations - Deionization Systems

The major problem observed in those facilities with DI systems was a lack of assurance that resin beds regenerated off-site are adequately disinfected and free of industrial contaminants. Facilities are advised to institute such measures. A second problem was failure to include alarms on output resistivity monitors. This may be due to a lack of awareness that an exhausted resin bed can actually introduce contaminants into the product water at relatively high levels. Facilities are advised to include audible as well as visual alarms on DI product resistivity monitors.

E. Softeners

The data for softeners are listed in Table W6. The product label findings with respect to softeners are similar to those discussed under RO systems. Four of the twenty-seven facilities having softeners in place utilize an exchange tank service. None of the four has provisions in place for the prevention of the return of tanks contaminated by non-medical users, and only one has a provision for the disinfection of exchange tanks prior to use. The remaining facilities employ in-house regeneration; twenty-two utilize an automatic regeneration system timed to regenerate during non-dialysis hours. Of these, eight are configured such that contaminants could enter the water system if regeneration were to occur when patients are undergoing dialysis, although all eight have RO units downstream of their softeners.

Discussion/Recommendations - Softeners

The major problem associated with the use of softeners was failure to provide that units regenerated off-site are adequately disinfected and not contaminated by non-medical users, and lack of a mechanism for the prevention of contaminated water from entering the system during automatic regeneration. It could be argued that most facilities have downstream treatment which is sufficient to remove any contaminants which could be introduced, but it is our belief that any avoidable contamination represents an unnecessary challenge to the system. This is particularly true when the nature of the contamination is unknown. Facilities are advised to take steps to ensure that softeners regenerated off-site are disinfected and not contaminated by non-medical users, and that controls are in place so that facility personnel are alerted in the event that system regeneration is inappropriately initiated.

Water Quality Standards

The water quality standards employed at each facility are summarized in Table W7. California requires that water systems, upon installation, be capable of providing water which meets FDA recommended standards, or which conforms to the requirements specified in the American National Standard for Hemodialysis Systems, ANSI/AAMI RD-5, 1981. Twenty-seven facilities have established conformance with the AAMI standard as a minimum requirement. One facility has maximum allowable levels for certain contaminants lower than specified by AAMI. Two facilities have established a "no growth" microbiological standard rather than the 200 CFU specified by AAMI. One facility requires their water to be pyrogen free. Only one facility does not have maximum allowable levels established for the contaminants referenced in the AAMI standard and has specifications for total dissolved solids and hardness only.

A. Validation

For the purposes of this study, validation was considered to be a process whereby it is shown, with a high degree of assurance, that a water system is capable of consistently producing water with contaminant levels within specified limits, even during "worst case" operating conditions. Worst case conditions include maximum expected feed water contaminant levels, and minimally acceptable water system operating parameters such as RO rejection rate, deionizer resin depletion, filter pressure differentials, etc. Some may refer to this activity as equipment qualification. The concept of validation was not familiar to most facility personnel interviewed during the study. System validation was generally not performed by the dialysis units themselves; their participation was limited mostly to specification of product water quality, with system design and validation left to the expertise of the vendor. The extent of validation performed was generally unknown to the facilities, but twenty-four of the thirty-one believed that their vendors had performed some sort of validation of their system. The water system vendors were not included in the study but based on review of written materials supplied by vendors to the facilities, maintenance and service records, and some vendor contact, it appears that validation as defined earlier is generally not performed. Instead, reliance is placed on overspecification and post-installation monitoring of product water quality. There was nothing to indicate that "worst case" analysis is regularly performed, at least formally.

Discussion/recommendation - Water System Validation

The majority of facilities take little responsibility for validating their water systems; leaving this activity to vendors. The ability of vendors to properly perform this function is unknown; some vendors appear to have considerable expertise in dialysis water systems while others may not. Those who install and maintain dialysis water systems apparently are not licensed, controlled, or otherwise regulated by the State or any other government agencies. It is therefore recommended that dialysis facilities take a more active role in water system specification by requiring that the system be properly validated, including:

(1) Specification of product water quality;

(2) Requiring that a "worst case" analysis be performed to ensure that the system can produce water of acceptable quality under all anticipated conditions of use. Facility involvement in this step is particularly important because medical judgement which cannot be made by the vendor may be involved;

(3) Establishment of system monitoring requirements to ensure that the system is always operated under the conditions for which it was validated. These may include, but not be limited to, RO rejection rates, feed water temperature, feed water quality, system pressures, system flow rates, etc. This also includes the identification of individuals responsible for each monitoring activity, action levels, and appropriate response (action) when action levels are exceeded.

Control Measures

Validation of water treatment equipment alone is insufficient to assure satisfactory system performance. The feed water, product water, and system operating parameters must be monitored periodically to verify that the system is operating within validated limits, and that the product water conforms to stated quality standards.

A. Source Monitoring

Monitoring of source water can help provide assurance that feed water contaminant levels do not exceed those for which the water system has been validated and can be of three types. "Off-line" tests such as bacterial culturing and laboratory analysis for contaminants can be performed periodically to determine input water quality. These tests are useful to identify trends in water quality but do not provide information on day-to-day variations. "On-line" tests conducted such as those for hardness, pH, chlorine, chloramine, and conductivity provide staff with immediate information regarding input water quality, and are used as necessary as a basis for making feed water adjustments (e.g., pH), or in combination with product water measurements for assessing system effectiveness.

A third source of information on input water quality is the water district or other authority which supplies water to the dialysis facility. Changes in treatment methods and source can have a profound impact on input water and the ability of the facility water treatment equipment to provide water of acceptable quality. Everyone is aware of the problems experienced by dialysis facilities not prepared to treat water to which chloramines have been added. An agreement with the water district whereby facilities are regularly notified of such changes is necessary. In addition, facility notification is necessary in the event of municipal water treatment equipment failure, damage to the distribution system, chemical spills, and other situations occurring outside the facility which may adversely impact water quality.

The source water monitoring activity conducted by the subject facilities is listed in Table W8. Eight of the thirty-one facilities have their source water analyzed annually for the contaminants included in their respective water quality standards. Six of the facilities perform microbiological testing; the testing frequencies vary from weekly to annually. Thirteen of the subject facilities do some sort of daily "on-line" monitoring and logging of their source water for one or more of the listed characteristics. Three additional facilities monitor their source water, but less frequently. Sixteen of the subject facilities have some type of agreement with their respective water districts to notify them of changes. Some agreements involve chloramines only, while others are broader in scope. Three of the sixteen facilities regularly receive copies of reports of analyses conducted by the supplier. Two of the facilities perform no monitoring at all.

Discussion/Recommendations - Source Monitoring

The extent of source water monitoring varies greatly between facilities. Some variation is to be expected because the appropriate monitoring level is determined, in part, by the quality history of the source water. Certain water supplies are relatively static with respect to water quality, others exhibit extreme variability. Facility personnel were generally unaware of their source water quality characteristics and the rationale for their source water monitoring practices. It is not unusual for the water system vendor to specify the monitoring to be done via a maintenance or service agreement, rather than the facility itself. Some monitoring had been instituted as a result of specific problems, such as high microbial counts. Chloramine monitoring is required by the State of California when chloramines are or may be present in the source water.

Several facilities reported an unwillingness on the part of the water districts to enter into an agreement to notify facilities of changes which could impact water quality; others believed that they would be notified even though they had no formal agreement. It is recommended that facilities take an active role in determining source water characteristics. Source water quality must be known, including expected fluctuations, in order to identify monitoring requirements. The type and frequency of monitoring will depend on this result. The water district agreement is a key component of this process. Even though a water system may be capable of handling the majority of source water fluctuations which occur, the chloramine problem graphically illustrates the fact that changes occurring which facilities are not equipped to handle can have severe consequences. A water district agreement which provides facilities advance warning of impending changes gives them the opportunity to evaluate the impact of the change on product water quality before it occurs, and take whatever action is necessary to avoid problems. Agreements should be as specific as possible, so that water district personnel are not left to make decisions more appropriately made by the dialysis facility, and should always include provisions for facility notification when situations occur outside the facility which could impact water quality.

B. System Parameter Monitoring

System parameter monitoring activity is summarized in Table W9. System parameter monitoring should be performed to determine the operating state of the equipment to ensure that it is functioning within the validated limits. The parameters listed represent those most frequently monitored and those considered to be applicable to most facilities. It can be seen that the monitoring activity varies considerably among facilities. Most facilities maintain a water system daily log in which system parameters are recorded. Recording is frequently performed on system startup and when there is a shift change. Many facilities, however, do not have action levels specified for the parameters monitored. Seven of twenty facilities monitoring RO rejection do not have action levels specified. When asked how it was determined when action was necessary, some responded that they primarily look for change information and that the specific values are not that important; others responded that they know what "normal" readings are and that abnormal readings are handled on a case-by-case basis.

Discussion/Recommendation - System Parameter Monitoring

Many facilities do not adequately monitor their water treatment system. The measurement of RO rejection rate, for example, is the best way to assess RO system performance; yet, nine of the facilities do not monitor this parameter. The failure to establish action levels for parameters which are monitored places inappropriate reliance on the ability of a facility to handle problems on an ad-hoc basis. The absence of a key person (e.g., the chief technician, or the Medical Director) may prevent a facility from being able to effectively deal with a problem unless the appropriate action(s) have previously been specified.

It is recommended that each facility implement system parameter monitoring requirements which are sufficient to provide assurance that the system is operating within validated limits. Action levels should be specified and appropriate action identified for each parameter monitored. Responsible individuals should be aware of the rationale for each monitoring activity and appropriate corrective action. Training should be conducted as appropriate.

C. Product Water Monitoring

Product water monitoring activity is shown in Table W10. A periodic analysis of water for conformance with the water quality standard is appropriate to evaluate system performance over the long term. The majority of facilities test their water at least annually, although a surprising number (8) do not, even though a quality standard is in effect. Twenty-five of the facilities perform microbiological testing at least monthly.

"On-line" tests for hardness, conductivity, chlorine residual, etc., provide feedback regarding day-to-day water quality and are an essential part of a monitoring program. Nearly all of the facilities document the performance of at least one on-line test of water quality. For those facilities with chloramines in the source water, daily testing is required by the State of California. The high degree of compliance with this requirement is likely due to the level of publicity associated with chloramine usage in California coupled with a recent comprehensive effort on the part of the State to ensure that facilities meet minimum standards for chloramine removal.

Discussion/Recommendations - Product Water Monitoring

The standard of practice for product water monitoring at most of the subject facilities appears to be annual testing of water for compliance with the water quality standard (usually AAMI), monthly microbiological testing with a provision for more frequent testing if the result exceeds that established as acceptable, daily monitoring of conductivity, and chloramine testing when appropriate. These practices may be appropriate if coupled with adequate monitoring of system parameters and action levels are established. It is interesting to note that only one facility routinely tests for pyrogens.

D. Maintenance and Calibration

Maintenance and calibration (M&C) procedures are summarized in Table W11. Blank spaces indicate that facility personnel do not perform the indicated activity, and records do not show that the activity is performed by a contractor or vendor. In those facilities where M&C is performed by an outside contractor, facility personnel were found to be generally unaware of the specific activities performed by the contractor.

Essential maintenance activities such as cleaning or replacement of RO membranes, pump lubrication, filter changes, and regeneration or exchange of DI units and softeners were most frequently documented as being performed on a regular basis. These were generally performed by the water system contractor, although facility personnel in some instances replace filter cartridges and replenish brine tanks as needed.

Calibration of measuring equipment is not a regular practice in most facilities. The calibration activity most likely to be performed is an independent check of in-line conductivity meters. Flowmeters, timers, and pressure gauges apparently are rarely checked or calibrated.

Less than half of the facilities reported regular disinfection of the entire water system, although it is not uncommon for facilities to perform UV disinfection or iodination of product water.

Discussion/Recommendations - Maintenance and Calibration

Practices with respect to the maintenance and calibration (M&C) of water treatment equipment vary significantly between facilities. Most facilities have water system maintenance agreements in effect and perform little M&C activity in-house. The extent of activity performed by contractors was indeterminate in many cases due to a lack of documentation. The scope of the study did not include interviews with the contractors themselves. Based on the information available, it can be concluded that the extent of M&C activity being performed is frequently determined by the contractor rather than the facility. The documentation reviewed suggests that there may be considerable variability among contractors with regard to specific activities performed, although it is possible that more activities are performed than are documented.

As discussed earlier with regard to validation, an essential element of a validation program is maintaining control over key parameters to ensure that the equipment is operating within validated limits. This includes identification of necessary maintenance and calibration requirements. Although some contractors appear to have considerable experience in designing and maintaining water systems for dialysis, it cannot be assumed that they have sufficient knowledge of the effects of water quality on dialysis patients to assume this responsibility without interaction with the facility. Facilities are therefore advised to take a more active role in assuring that all necessary activities are identified, performed, and documented.

California Dialysis Facility Study

REUSE OF DISPOSABLES SECTION

The purpose of this section is to present results and to discuss the findings of that portion of the dialysis facility study pertaining to the reuse of disposable medical devices. It should be noted that disposable medical devices refers to those devices which are labeled as "Single Use Only" or "Not to be Reused or Resterilized". This section does not discuss the disinfecting procedures or criteria for dialysis delivery equipment which is addressed in its own respective section. This section confines itself to the reuse of hemodialyzers, specifically hollow fiber hemodialyzers, in as much as no appreciable reuse of any other medical device was found at the facilities. There was no reuse of any other type of hemodialyzer other than hollow fiber dialyzers.

Introduction

In each dialysis facility visited, the following general categories of data were obtained:

(1) Trade name and model of hemodialyzers reused;

(2) The origin of any reuse standard, protocol, or procedures for reprocessing the hemodialyzers;

(3) If applicable, the make and model of any automatic reprocessing machine;

(4) Tests applied by the facility to determine fitness for subsequent use in dialysis treatments;

(5) Types of cleaning and disinfecting agents employed and where available, the concentration of disinfecting agent used;

(6) Rinse procedures employed to purge disinfectant solutions from the dialyzer, and the method and sensitivity for residual testing;

(7) Securing of patient informed consent to participate in the facility's reuse program;

(8) The standard for water purity employed for reprocessing dialyzers;

(9) Problem experience due to reuse and reprocessing of hemodialyzers.

Samples of the data sheets used during the site visits are contained in Appendix 1. Since the AAMI Standard for Hemodialyzer Reprocessing is in the comment phase and has not been formally adopted as of this writing, comparisons of the findings with the AAMI document will not be performed.

However when applicable, comparisons will be made to the proposed California Hemodialyzer Reuse Regulations (see Appendix 3).

Hemodialyzer Equipment Summary

The types of hemodialyzers reprocessed are summarized in Table R1; this table represents the number of facilities which use a particular dialyzer, not the relative consumption of that dialyzer within the facilities. Only hollow fiber hemodialysis filters were reprocessed; no coil or parallel plate dialyzers were encountered in the study.

Table R1. Observance of Hemodialyzer Use in California Dialysis Facilities

Hemodialyzer	No. of Facilities	Percent observed
Travenol 1211	15	19.5%
Travenol 1511	13	16.7%
Travenol 2308	8	10.3%
Terumo TAF 8	4	2.6%
Terumo TAF 10	4	2.6%
Erika PCS A10	4	2.6%
Erika PCS B10	4	2.6%
Erika PCS C10	4	2.6%
Terumo TAF 12	3	1.9%
CD Medical SCE 90	3	1.9%
Travenol 1508	2	1.3%
Gambro G80H	2	1.3%
Gambro 120x	2	1.3%
CD Medical SCE 135	2	1.3%
CD Medical C-DAK 4000	2	1.3%
Travenol CA 70	1	0.6%
Toray B150	1	0.6%
Terumo TAF 6	1	0.6%
Ashai AM150M	1	0.6%
Cobe HF100	1	0.6%
Cobe 18-510	1	0.6%

The Travenol line of hemodialyzers is reused by approximately 50 percent of facilities practicing reuse. There may be several factors influencing their use in reuse programs which may include: ease of reprocessing, availability from vendor, price, etc. Because these factors were not included in the study questionnaire, conclusionary statements on this relative percentage would be speculative.

Origin of Reuse Protocol and Procedures

The summary results on the origin of reuse protocols and procedures for those dialysis facilities having reuse programs are presented in Table R2. In those instances where facilities adapted a procedure obtained from another source to their own reprocessing operation, the original or primary source is listed as the origin of the protocol. When possible, copies of the reuse protocols were obtained.

Table R2. Reprocessing Protocol Origin

Origin of Protocol	No. of Facilities	Percent observed
In-house	9	33.3%
Reprocessor manufacturer	7	25.9%
Local ESRD Network	4	14.8%
Corporate generated	4	14.8%
AAMI Draft Guidelines	1	3.7%
Calif. DHS Regulations	1	3.7%
Unknown	1	3.7%

While nine facilities specified in-house originated protocols, the actual origin of procedures and standards may well be from other unidentified sources. In many cases, the respondents were unable to state the source of these procedures even though approved for use by the facility's medical director and nursing staff.

The Department has based the quality assurance requirements contained in its proposed regulations on the reuse of hemodialyzers on the federal Good Manufacturing Practice (GMP) regulations governing the manufacture of medical devices. Aspects of the reuse regulations involve: a master device record specifying accepted standards and procedures in use at the facility, a device history record describing the reprocessing steps taken and documenting test results, records describing the training of the reprocessing technician, equipment maintenance records, quality assurance audits, and other quality control specifications and parameters. In review of the protocols obtained during this study, none were complete or comparable in scope and application to the Department's proposed regulations. The protocols reviewed were limited to specification of the exact procedures utilized in dialyzer reprocessing with little attention placed upon quality assurance.

In many cases, the reprocessing procedures were unavailable in the reprocessing area for immediate reference to the reprocessing technician. Procedures authorized for use by the facility were often times not fully employed by the reprocessing technician in favor of alternate procedures and tests. Facility personnel frequently stated that the reuse procedures are due for updating. Specific procedures, standards, and protocols for the reprocessing of hemodialyzers varied widely from facility to facility; but, in general, the main procedures involved included: treatment termination, dialyzer isolation and storage until cleaning, dialyzer cleaning with cleaning agent, dialyzer rinsing, fiber bundle volume and other acceptance tests, storage with disinfectant, dialyzer disinfectant rinsing, residual testing, and treatment setup.

Conclusions/recommendations

All dialysis facilities appeared to be satisfied that they were providing safe and effective reprocessed dialyzers for use in patient dialysis treatments. However, the observation that facilities are frequently not adhering to their protocols, and the general lack of quality control control and assurance procedures indicates that at least some of the reuse programs are not operating in a state of control. Reuse procedures, quality assurance procedures, quality control tests, and standards should be formally adopted within the facility by means of a comprehensive validated protocol. Adherence to this document should be mandatory until alternative reprocessing steps have been validated for safety and efficacy and instituted by the appropriate approving authority. Where at all possible, references establishing a reprocessing step should be documented as to source. In this way, reasons justifying a certain reprocessing procedure may be easily researched.

Reprocessing procedures should be readily available for reference by the reprocessing technicians and nursing staff. With the inclusion of informed consent, such procedures should be made available to patients upon request.

Automated Reprocessing Machines

The advent of automated dialyzer reprocessors is a relatively new phenomenon with the initial development of the Lixivitron II in the early 1980s. The intent of the manufacturers of these devices is to replace the labor intensive manual methods of dialyzer reprocessing with a standardized automated procedure.

Table R3 presents the summary of the types, age, and frequency of observance of automated reprocessors encountered during the site visits. No facility had more than one type of automated reprocessor but may have had more than one of the same type.

Table R3. Summary of Automated Reprocessing Devices

Reprocessor Type	No. of Facilities	Median Age	% Observed*
Renatron RS8300	4	2.5 yrs.	26.7%
Seratronics DRS4	3	1.5 yrs.	20.0%
Seratronics DPS4	3	1.5 yrs.	20.0%
Lixivitron II	2	4.0 yrs.	13.3%
CompuDial KP1	1	2.0 yrs.	6.6%
ECHO 5000	1	new	6.6%
custom built (DRS III)	1	unknown	6.6%

* Column may not add to 100% due to roundoff error.

The Renatron manufactured by Renal Systems was observed most often. Two of the facilities had two separate units.

The Seratronics Dialyzer Reprocessing System DRS4 and the Dialyzer Preparation System DPS4 provide unique functions. The Dialyzer

Reprocessing System is used in the first phase of dialyzer reprocessing: that of cleaning, testing, and storage of the dialyzer with disinfectant chemical. The Dialyzer Preparation System is the only system of its kind observed. It provides the functions of dialyzer disinfectant rinsing, priming, and residual testing to within the limits established by the facility. The remainder of the reprocessing devices were similar in function to the DRS. The DRS4 and the DPS4 were used in conjunction at one facility whereas two other facilities had either the DRS or the DPS system.

This study was not designed to obtain information regarding the maintenance required for these systems. In retrospect, this information would have been of value to gauge the reliability of these systems. A frequent system breakdown would a pose considerable problem for the facility which relies heavily upon reuse.

It was noted previously that vendors of such devices are instrumental in providing the origins of standardized reprocessing protocols and procedures for dialysis facilities. It has been observed that these vendors will provide in-service training of personnel for reprocessing dialyzers and for the repair of the reprocessing devices.

Quality Control Tests

Table R4 presents the results of the frequency of occurrence of quality control tests to determine the suitability of the dialyzer for further use in patient treatment. Four performance criteria were included in the study. Two additional tests or conditions are frequently applied to assess suitability for further patient use: cosmetic appearance, and maximum number of uses.

Table R4. Functional Performance Tests for Rejection

Test	No. of Facilities	Percent Observed
Cell Volume	26	37.7%
Cosmetic	21	30.4%
Maximum No. Uses	12	17.4%
Ultrafiltration	5	7.2%
Leak Test	5	7.2%
Clearance	0	0

The majority of respondents indicated that a total cell volume reduction of 20 percent was the functional rejection criteria for any dialyzer. One respondent indicated that dialyzers were acceptable with a 30 percent reduction. It should be noted that there was some uncertainty among the respondents as to what was actually being measured for the the functional test. Fiber Bundle Volume (FBV) is that volume of the blood path in the dialyzer minus the head volume contained in the arterial and venous ends. Total Cell Volume refers to the blood path volume within the dialyzer. It was unclear from the study which test was being applied by those facilities measuring a reduction in cell/bundle volume.

Manufacturers of hemodialyzers normally supply the nominal TCV on the labeling of the device. Because this is a nominal value with perhaps a 10 percent variance in either direction, some dialysis facilities were observed to measure the actual cell volume of each dialyzer prior to the first treatment. The result of this measurement was then tagged to the individual dialyzer. The dialyzers were then filled with disinfectant and essentially "reprocessed" prior to initial use. Other facilities did not pretest but relied upon the devices' nominal labeling.

Cosmetic appearance was a frequent criterion for determining the acceptability of the dialyzer for subsequent uses. It cannot be considered a performance test in that no performance criteria can be associated with a poor cosmetic appearance of the dialyzer fiber cells. In five of the facilities, it was indicated that cosmetics was an important part of the acceptance process because the dialysis patient had the option to refuse further use of the reprocessed dialyzer.

Twelve facilities indicated a maximum number of uses criterion. The range of maximum uses was indicated to be 12 to 30 with an average maximum use criterion around 15.

Ultrafiltration rate and leak tests were not observed outside the use of automated reprocessors. The Seratron and the Lixivitron employ ultrafiltration measuring capabilities. The ultrafiltration coefficient, K_{uf}, is determined and used as a measure of dialyzer functionality.

In-vitro or in-vivo tests for clearance utilizing test molecules (such as inulin or Vitamin B_{12}) were not employed by any facility.

Conclusions/recommendations

It is readily apparent that volume testing is the easiest and preferred method for determining dialyzer functionality. The use of the 20 percent reduction criteria in TCV is historical based upon a correlation of volume degradation and small molecule clearance. This correlation is not absolute; there is error involved. Perhaps the addition of the error associated with measurement of the TCV instead of the more precise value of FBV, and of the error associated with the nominal ± variance in the TCV labeled for the dialyzer will not impair the determination of dialyzer functionality. Certainly both these errors are being tolerated by the majority of dialysis facilities visited. Further analysis is required to assess the need for more precise testing methods, as currently employed by some of the facilities visited.

While there is debate over the relative value of the use of TCV as correlated with small molecule clearance, and the determination of the ultrafiltration rate which is proposed to be a more accurate measure for the clearance of middle molecules, it is recommended that, at the minimum, either method be employed to determine dialyzer functionality. It is felt that dialysis facilities neither have the means nor the time to perform clearance tests on a routine basis. Clearance testing may be appropriate in validating a reuse protocol, however.

Cleaning and Disinfection

Table R5 lists the types of cleaning and disinfection solutions used at those dialysis facilities which have a reuse program. When possible, the concentrations of these solutions were noted. "C" refers to a solution used in cleaning whereas "D" refers to solutions used in disinfection.

Table R5. Cleaning and Disinfection Solutions

Solution/Concentration	Use	No. Facilities
Hydrogen peroxide*	C	4
Hydrogen peroxide/3%	C	2
Sodium Hypochlorite*	C	5
Sodium Hypochlorite/to 1%	C	3
Sodium Hypochlorite/>1 to 2.5%	C	1
Renalin (Peracetic acid based)	CD	4
Formaldehyde*	D	8
Formaldehyde/to 1.5%	D	3
Formaldehyde/2% to 3%	D	9
Formaldehyde/4%	D	4

* Concentrations were unspecified

Facilities were divided somewhat evenly in the use of sodium hypochlorite (bleach) and the use of hydrogen peroxide. These cleaning solutions are used to remove organic material deposited on the fiber surface. The use of Renalin as a cleansing agent follows with the use of the Renatron automated reprocessor. There is no significance which can be attached to the concentration of the cleaning solutions employed by the subject facilities with regard to relative effectiveness. None of the subject facilities perform tests to determine the amount of residual cleaning solution which may remain in the dialyzer through the disinfection process.

Formaldehyde is the disinfecting agent of choice at the sites visited. The median concentration used appears to be in the two percent to three percent range. Many of the facilities were unable to indicate the concentration of formaldehyde used in the disinfection process. The use of the term "sterilization" was often used to describe what is now considered a high level disinfection process.

Other chemical agents such as gluteraldehyde and the new disinfectant product manufactured by the Alcide Corporation were not observed to be in use at the facilities visited.

Conclusions/recommendations

In the proposed California Hemodialyzer Reuse regulations, specific cleansing agents are not specified. The Department has left the development and use of this test to the facilities. However, no adverse effects on dialysis patients or on hemodialyzers have been documented due to use of either sodium hypochlorite or hydrogen peroxide in relatively low concentration.

Much controversy is associated with the use of formaldehyde as a disinfecting agent in the reprocessing of hemodialyzers. Formaldehyde has been included on the NIOSH list as a potential human carcinogen. The long-term effects of low level systemic exposure in the amounts encountered in the dialyzer has not been scientifically documented and is therefore unknown.

Because of the lack of knowledge regarding the dialyzer formaldehyde residual levels which can be tolerated by dialysis patients, it is reasonable to make efforts to minimize patient formaldehyde exposure as much as possible. Based upon an adequately controlled and maintained water system with the final product water used as makeup water for cleaning and disinfecting solutions and rinse water being supplied by a reverse osmosis system, the Department in its proposed Hemodialyzer Reuse Regulations specifies a formaldehyde concentration of at least 1.5%. Independent of the disinfectant concentration employed, the disinfection process should be properly validated to ensure effectiveness. Control measures should be instituted to minimize bioburden, including use of properly treated water, water system specification and control, and aseptic technique in the reprocessing and handling of dialyzers.

Rinse Procedures

The majority of the facilities (20) performed a sterile saline flush to purge the dialyzer of disinfectant chemical. Four facilities use water to continuously flush and purge the dialyzer. The latter was observed at facilities employing the Seratronics DPS4 which performs a reverse flushing procedure. It was noted that 18 of the 20 facilities which provided a sterile flush used the dialysate delivery equipment with a recirculating closed loop on the blood path to "dialyze out" the remaining disinfectant chemical. After a period of dialyzing, the dialyzer is tested for residual disinfectant.

An area for further study may be to determine the amount of time required for performing the recirculation method of rinsing versus the amount of residual tolerated in the dialyzer.

Disinfectant Chemical Testing

Table R6 presents the data associated with disinfectant chemical testing standards and procedures. Where possible, information was obtained on the sensitivity of the tests employed and whether the test procedure was validated.

Ten facilities use a modified Schiffs reagent for the testing of formaldehyde residual in the dialyzer after disinfectant purging. In several cases, the sensitivity of the test was not known to the facilities. In one case, the sensitivity of the test was stated to be at five ppm (this respondent also indicated that this test had been validated to one ppm) but that the tolerable disinfectant limit was at one ppm. The Formalert and Formaclear are commercially available formaldehyde tests based upon a Schiffs reagent and Haunch reagent respectively. The Fast Formalert is a modified Formalert test which employs an incubator at 37° C to speed up the reaction process. Clinitest has been shown to vary in sensitivity from 10 to 40 ppm. Facilities utilizing this test relied upon a negative Clinitest reaction for acceptance of the disinfectant residual test. One facility specified a five ppm residual limit, but used the Clinitest with its 10 to 30 ppm sensitivity for acceptance testing.

Table R6. Residual Disinfectant Chemical Testing Facility Summary

Disinfectant	Test/Sensitivity	Limit	No. Facilities
Formaldehyde	Schiffs/unknown	unknown	2
	Schiffs/unknown	2 ppm	1
	Schiffs/unknown	<5 ppm	1
	Schiffs/1 ppm (?)	2 ppm	1
	Schiffs/2-5 ppm	unknown	2
	Schiffs/2-5 ppm	5 ppm	2
	Schiffs/5 ppm	1 ppm	1
Formaldehyde	Formaclear/1 ppm	2 ppm	1
	Formaclear/2-5 ppm	unknown	1
	Formaclear/5 ppm	5 ppm	2
Formaldehyde	Clinitest/10-40 ppm	unknown	3
	Clinitest/30 ppm	5 ppm	1
Formaldehyde	Fast Formalert/2 ppm	5 ppm	2
	Fast Formalert/2 ppm	10 ppm	1
	Formalert/5 ppm	5 ppm	2
Renalin	Renalin strip/<1 ppm	<1 ppm	4

Conclusions/recommendations

Among all the quality control procedures for reuse that were observed in the sites visited, the testing for the amounts of formaldehyde disinfectant residual was the worst.. It was apparent that there was no validation of the rinsing procedures to obtain the desired disinfectant residual limit for manual and automatic rinsing systems. Likewise, the sensitivity of the test for those facilities which supplied their own modified Schiffs reagent was generally unknown indicative of further lack of validation.

It was felt that the depth of understanding of the principles associated with disinfectant chemical testing was seriously lacking among reprocessing technicians performing this crucial quality control test. Reprocessing technicians should be aware of the test methods and controls placed upon this quality control test. For this, training, including familiarization with validation procedures, should be integral in the facility's reuse protocol.

It is not the purpose of this study to supply a recommendation for dialysis facilities on the maximum amount of disinfectant residual which is tolerable in the dialyzer. This is an area of some controversy and has been addressed in the AAMI proposed reuse guidelines and by the State of California in its proposed regulations. Whatever the standard employed by the facility, specifying a test suitably sensitive to the standard as validated by an independent process validation procedure is mandatory. Again, this was something seriously lacking at the sites observed. With that, a periodic quality assurance audit of this and other procedures which rely on in-process control should be performed by individuals outside of immediate production responsibility. This audit requirement mirrors that which is generally required under the device GMP regulations.

Informed Consent

All of the dialysis facilities which had a reuse program indicated that informed consent was obtained from the patient. The extent of this consent including the rights of the patient in the reuse program was not explored but may well be a subject of future study. In some instances, as previously indicated in the Quality Control section, the patient did possess the right to refuse the use of a dialyzer that did not appear to be cosmetically desirable.

The Department in its proposed regulations has specified a comprehensive patient rights position including the right of the patient to not participate in a reuse program and not be abridged of any dialysis service normally provided. A full explanation of the procedures, methods, and standards must also be provided to the patient upon request. In addition, the patient has the right to submit a complaint and expect an adequate resolution.

Water Purity Standard

All but one of the facilities with a reuse program specified a water purity standard of either that associated with the dialysate delivery system (most often from the reverse osmosis water system) or the AAMI water standard for hemodialysis. The remaining facility used a corporate standard; the details of this standard were not obtained.

The Department has specified in its proposed regulations that the makeup water for all use in dialyzer reprocessing be from the reverse osmosis system. It is shown in the Water Treatment section of this study that all but two of the facilities use reverse osmosis treatment with one of them in the process of obtaining this treatment system. Further, the proposed regulations require bacterial limit monthly monitoring to a 200 colony forming unit (CFU) standard with the additional requirement of pyrogen testing for those facilities which store water used in reprocessing procedures.

Reuse Problem Experience/Other Disposables Reused

Table R7 presents the summary data on facilities experiencing problems specifically pertaining to the reprocessing of dialyzers.

A total of eight facilities reported that problems were experienced attributable to the reuse program. As summarized above, facilities indicated that there were hypersensitivity reactions thought to be caused by the formaldehyde disinfectant residual. Dialyzer mix-up is a labeling control problem which has occurred sporadically. Hollow fiber blood leaks may be attributed to the action of the cleansing solution, hydrogen peroxide or sodium hypochlorite, upon the dialyzer fibers; this may be true especially at higher concentrations of the solutions. Two facilities indicated that staff had been exposed to splashes of formaldehyde disinfectant chemical. Reprocessing equipment failure might be assumed to be more than indicated above, but only one facility felt strongly enough to indicate that this was a definite problem.

Table R7. Reuse Problem Experience

Problem	No. of Facilities
Formaldehyde patient reaction	4
Dialyzer mix-up	3
Hollow fiber blood leaks	2
Occupational formaldehyde splashes	2
Patient pyrogenic reaction	1
Reprocessing equipment failures	1

One facility indicated several pyrogenic and septicimic responses directly attributable to the reuse process. It was found that procedures for diluting the formaldehyde chemical, nominal 37% formaldehyde, into the usable 1.5 percent by volume disinfectant chemical solution were incorrect. Tests revealed that the actual concentration of the formaldehyde solution approximated 0.5 percent allowing for bacterial growth in both the disinfectant chemical storage container and, apparently, in the patient dialyzers themselves. This situation was corrected by revalidation of the diluting procedures to reach the desired solution concentration.

Four facilities indicated reusing either transducer covers or arterial blood lines. In the case of the transducer covers, it was found that the facilities placed the covers in a gluteraldehyde solution (Cidex). Preparation for use involved simple rinsing of the covers with water; no disinfectant residual testing was performed. Caps used to cover the dialyzer blood and dialysate ports were also observed to be reprocessed in a similar manner. Arterial blood lines were reprocessed at two facilities but were kept as an integral part of the reprocessed dialyzer. All reprocessing operations for the blood lines were, therefore, the same as for the hollow fiber dialyzers. No testing for disinfectant residuals was indicated by the facilities.

Conclusions/recommendations

Problems with reuse experienced in any dialysis facility may reflect a lack of quality control over a reprocessing operation. In all cases, problems should be formally investigated with documentation showing failure resolution designed so that the problem will most likely not reoccur.

PROBLEM EXPERIENCE SECTION

Facility problem experience as reported to the study teams is summarized in Table P1. Problems associated with reuse are reported in the Reuse Section of this report. Routine repair and maintenance of equipment is not included. Each reported problem is classified according to whether the primary cause of the problem appeared to be equipment, facility, procedure, or patient related. This is helpful in identifying general trends regarding problem source, although it must be recognized that problems frequently result from a combination of factors. Water system problems were generally categorized as facility-related since most systems are permanently installed. Such problems could also have been classified as equipment related, however. Patient reactions to new dialyzers were classified as being equipment related unless the problem could be directly attributed to procedural deficiencies, but could perhaps also be classified as being patient related since this problem is frequently patient specific.

Twelve of the forty-nine problems, or approximately twenty-four percent, were related to facility procedures. Four of the twelve resulted from failure to follow procedures; three of these resulting in injury or potential injury to staff rather than patients. The remaining were due to inadequacy of existing procedures. Three problems were attributable to inadequate preventive maintenance of dialysis equipment.

Approximately forty-seven percent (22) of the problems were equipment-related. Fifteen of these were associated with patient sensitivity to new dialyzers, however. The severity and frequency of patient sensitivity to dialyzers was frequently reduced by switching the patient to a dialyzer with a different membrane material, increasing the volume of the pre-dialysis saline rinse, subjecting the new dialyzer to the reprocessing steps used in a reuse protocol, or pre-soaking the dialyzer with formaldehyde and then rinsing before use.

Approximately twenty-nine percent (14) of the problems were classified as being facility-related. Nearly all (12) of these involved problems with the water system. Five of the twelve water system problems were due to water system "dead spots" resulting in the inability to adequately disinfect the system or rinse formaldehyde from the system after disinfection. Seven involved system malfunction due to inadequate water pressure or insufficient capacity.

One sensitivity reaction was classified as being patient-related although the facility was unable to determine the source of the problem.

Discussion/Recommendations

The major problems experienced in the subject dialysis facilities appear to be associated with: (1) Patient sensitivity to new dialyzers; (2) Procedures; (3) Water systems.

Facilities are generally aware of "new dialyzer syndrome" and the various steps which can be taken to mitigate the problem. Care should be taken when attributing problems to new dialyzers that other possible contributing factors have been investigated and ruled out.

In general, procedural problems can be minimized in the development stage by anticipating potential problems and designing procedures to prevent them. In-house procedures such as the reuse of dialyzers, and the cleaning and disinfection of water treatment equipment should be suitably validated before use. The elements of validation are discussed elsewhere in this report. For dialysis equipment, manufacturer recommended maintenance, calibration, cleaning, and disinfection procedures should be adopted as minimum requirements. All procedures, once established, should be followed. Procedures should be periodically reviewed for adequacy and formally adjusted as appropriate.

Problems of the nature of those reported for water systems can be prevented in the design and installation stage by proper system validation. System capacity as well as the ability to disinfect and clear the system of disinfectant residual are major system considerations; yet, problems in these areas frequently occur. This observation suggests that facilities are not properly validating their equipment. This conclusion is supported by the results reported in the Water Treatment Section.

Reported problems involving equipment other than water treatment equipment were minimal.

Table P1. Problem Experience

PROBLEM	CAUSE	CLASSIFICATION	CORRECTION
Conductivity meter failure	Poor factory solder connections	Equipment	Repair as required
Dialysate bypass valve fail	Bicarbonate buildup on solenoid	Procedure	Uncorrected
Equipment fire	alarm failure - equip overheat	Equipment	Remove from service
False alarms	Testing of emergency generators	Procedure	Uncorrected
False conductivity alarms	Inadequate preventive maintenance	Procedure	Modify PM procedures
False cond, pH alarm	Alarms out of calibration	Equipment	Recalibrate
Formaldehyde in dialysate	Pooling in dialysate trunk line	Facility	Not corrected
Formaldehyde reaction	Formaldehyde in water system	Facility	Redesign system to eliminate pooling
Formaldehyde reaction	Water system "dead spots"	Facility	Modify water system
Formaldehyde spill	Procedures not followed	Procedure	Increase training
Formaldehyde splash	Procedures not followed	Procedure	Increase training
Formaldehyde splash	Staff not wearing goggles	Procedure	Goggles now mandatory
High product water bacteria	Inadequate disinfection	Procedure	Increase disinfection schedule
High product water bacteria	Water system "dead spots"	Facility	Modify water system
High product water bacteria	growth in storage tank	Procedure	Disinfect tank
Inadequate heat disinfect	Inadequate preventive maintenance	Procedure	Modify PM procedures
Inadequate ultrafiltration	Inadequate preventive maintenance	Equipment	Modify PM procedures
Insufficient product water	Demand exceeds capacity	Facility	Increase water system capacity
Insufficient product water	Demand exceeds capacity	Facility	Not corrected
Pt blood loss	Blood leak detector malfunction	Equipment	Repair leak detector
Pt blood loss	Separation of venous sample port	Equipment	Replace blood line
Pt cardiac arrest	Dialyzer not primed	Procedure	
Pt death	Formaldehyde in water system	Facility	Redesign system to eliminate pooling
Sensitivity reaction	First-use syndrome ?	Equipment	Subject new dialyzers to reuse protocol
Sensitivity reaction	First-use syndrome ?	Equipment	Subject new dialyzers to reuse protocol
Sensitivity reaction	Sensitivity to cuprophane	Equipment	Switch pts to CA membrane dialyzer
Sensitivity reaction	First-use syndrome ?	Equipment	Prime with 2000 cc saline
Sensitivity reaction	First-use syndrome ?	Equipment	Subject new dialyzers to reuse protocol
Sensitivity reaction	First-use syndrome ?	Equipment	Increase saline rinse
Sensitivity reaction	First-use syndrome ?	Procedure	Increase rinse or pre-soak w/formalin
Sensitivity reaction	Undetermined	Patient	
Sensitivity reaction	First-use syndrome ?	Procedure	Pre-soak dialyzer w/formaldehyde
Sensitivity reaction	First-use syndrome ?	Equipment	Change brand of dialyzer
Sensitivity reaction	Sensitivity to cuprophane	Equipment	Switch pts to CA membrane dialyzer

Table P1. Problem Experience

Sensitivity reaction	First-use syndrome ?	Equipment	Uncorrected
Sensitivity reaction	First-use syndrome ?	Equipment	Subject new dialyzers to reuse protocol
Sensitivity reaction	Sensitivity to cuprophane	Equipment	Switch pts to CA membrane dialyzer
Sensitivity reaction	First-use syndrome ?	Equipment	Double rinse new dialyzers
Sensitivity reaction	Sensitivity to cuprophane	Equipment	Switch pts to CA membrane dialyzer
Sensitivity reaction	First-use syndrome ?	Equipment	Subject new dialyzers to reuse protocol
Sensitivity reaction	First-use syndrome ?	Equipment	Subject new dialyzers to reuse protocol
Staff headaches	Formaldehyde	Facility	Install additional ventilation
Water formaldehyde residual	Water system "dead spots"	Facility	Modify rinse procedures
Water system shutdown	Unequal output of series RO units	Equipment	Not corrected
Water system shutdown	Low source water pressure	Facility	Uncorrected
Water system shutdown	Source water pressure fluctuation	Facility	Not corrected
Water system shutdown	Facility on 10th floor	Facility	Not corrected
Water system shutdown	Lawn sprinklers reduce pressure	Facility	Lawn not watered during dialysis
Water system shutdown	Source water pressure fluctuation	Facility	Not corrected

DEPARTMENT OF HEALTH & HUMAN SERVICES Public Health Service

Memorandum

Date August 14, 1986

From Commissioner of Food and Drugs

Subject FDA Comments on NCHSR/HCTA Report on Hemodialysis Reuse

To The Assistant Secretary for Health
Through: ES/PHS _______

We appreciate the opportunity to review the subject report and the appended recommendations for action. We believe that the report represents a comprehensive treatise on current clinical practices in the area of hemodialysis reuse and we commend the NCHSR/HCTA on its work.

Hemodialysis: Reuse and General Concerns

In reading over the report, we took special note of the fact that it affirms the testimony PHS witnesses presented before Congress last March -- that is, patients with end-stage renal disease (ESRD) who are treated with properly reprocessed dialysis devices are at no greater health risk than those who undergo treatment at facilities which engage in single use of such devices. However, like the report, we recognize that with the sharp rise in reuse of dialyzers and other dialysis devices, there is a potential increase in inadequate quality control, which could result in reprocessing problems. Such problems can arise due to deficiencies in user performance and to a general lack of information and protocols for effective reprocessing procedures. With this in mind, the PHS and the Department should now focus attention on means for minimizing unnecessary risks and assuring optimal care for the approximately 80,000 patients enrolled in the Medicare ESRD program.

While the dominant focus of recent concerns and the subject report has been on reuse of dialysis devices labeled for "single use," it should be emphasized that there are potentially serious problems with hemodialysis across-the-board that warrant equal attention, such as improper water treatment, inadequate mixing of the dialysate, and overheating of patients due to insufficient monitoring of dialysate temperature controls. We have also observed recent episodes of patient infections due to improper preparation and use of disinfectants employed in reprocessing. These broad-ranging problems have been highlighted at a number of conferences and in studies on dialysis in recent years, and they are being confirmed by some of the early results of a study we are conducting in three States and the District of Columbia.

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In view of these overall concerns and in the interest of adding an extra layer of safety to the practice of renal dialysis, including reuse, I would recommend that the Department consider having the Health Care Financing Administration (HCFA), under its End-Stage Renal Disease program authority,* incorporate specific guidance in its "Conditions for Coverage of Suppliers of ESRD Services" (42 CFR 405.2100). Such guidance could serve as the basis for ESRD program monitoring by State survey agencies. The main value of this approach is the avoidance of duplicate inspections and unnecessary expenditure of limited Departmental resources, which would occur if FDA were to institute a separate GMP program for the roughly 1400 dialysis facilities that are certified for participation in the Medicare program. As the NCHSR/HCTA report elucidates, and as the Department's legal counsel has previously advised, applying GMP regulations to physician-reprocessors may, in light of existing statutory language, raise significant legal issues. More importantly, given that clinical criteria for ESRD facilities have already been established and HCFA's State-based inspectional network is fully operational, the most sensible and cost-effective approach would be for quality control criteria to be incorporated into the current Medicare requirements. By providing such guidance, the Department would foster more effective operating procedures for dialysis personnel and facilities, which in turn would lead to better patient care, irrespective of whether a facility chooses to engage in single or multiple use of dialysis devices.

FDA Assistance

As you know, FDA, through its Center for Devices and Radiological Health (CDRH), has been active in recent years in the development of guidance for dialysis. For example, we contributed to the design of a voluntary hemodialysis system standard in 1982 under the aegis of the Association of the Advancement of Medical Instrumentation (AAMI). More recently, we have collaborated with AAMI in the development of a guideline on dialyser reuse, which should be available this fall. In view of our past involvement, I would like to offer the services of FDA to assist HCFA in the technical interpretation and adaptation of existing standards and guidance, and to work with HCFA officials in identifying other aspects of dialysis operations for which similar guidance might be needed (e.g., reuse of blood tubing). We could also be helpful in devising test methodologies for reuse, as recommended under item III.C. in the two-page addendum. This work could begin immediately and could involve assistance from CDC. The specific details of an implementation plan hinge on a decision regarding the feasibility and legal viability of using HCFA's ESRD program as a vehicle for assuring quality dialysis services.

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* NOTE: The ESRD program is authorized by P.L. 95-292, the "Medicare Program End-Stage Renal Disease Amendments of 1978."

In the area of standards development, FDA has had considerable experience in working with private sector standards-setting groups; in fact, a number of CDRH staff have participated on a number of committees charged to develop voluntary standards for medical and radiological products. In addition, we are mandated by the 1976 Medical Device Amendments to the Federal Food, Drug and Cosmetic Act to develop mandatory performance standards for certain medical devices. In view of this history and our in-house expertise, I would suggest that consideration be given to re-assigning some or all of the "standards" now assigned to CDC under item I.A., or, alternatively, to direct FDA to formally join with CDC in the execution of this task. I should note that in the area of disinfectants -- an item listed under item I.A. -- FDA is already working with CDC and the EPA (which has authority to license general purpose disinfectants) in developing specific guidelines for the premarketing review of anti-microbial agents used in disinfecting medical devices, including dialysis equipment.

I should also note that FDA's CDRH has enjoyed a long history of working with health professional and consumer organizations in the development of educational programs aimed at improving awareness of the risks and hazards associated with medical and radiation-emitting devices. The success of the Center's efforts were illustrated in the presentation given during your visit to FDA earlier this month, when we discussed various activities in the field of medical x-ray protection. In view of this longstanding activity, the Center's strong capabilities in the health education field, and its ties with professional groups, I believe it would be appropriate to have FDA assist the NIH in the educational tasks outlined under item V.A-B. Here again, we are ready to begin exploring options for physician and patient education programs.

Coordination of PHS Activities

The addendum to the report proposes a "mix" of tasks that cut across Service lines. Because of the complexity of the problems associated with dialysis and reuse and the range of possible actions to deal with them (i.e., research, education, and standards/guidance development), I believe that considerable interagency assistance and consultation (for example, in the standards area) will be required. To facilitate interagency dialogue and cooperation, and to ensure that HCFA receives the best available advice and technical assistance the PHS can offer, I would suggest that an entity within the Service be designated as a "floor manager" to oversee and coordinate the variety of PHS activities, and to serve as the primary interface with HCFA on this issue.

We in FDA stand ready to assist you and our sister agencies in establishing an effective PHS-Department strategy for effectively dealing with the safety of renal dialysis. I would be pleased to discuss with you how FDA resources and talents might best be utilized in this case, and to elaborate on the need for an internal mechanism to orchestrate all current and future hemodialysis activities within the PHS.

for Frank E. Young, M.D., Ph.D.

cc: Mr. Artim
Dr. Mason
Dr. Wyngaarden

bcc: Mr. Meyer
Mr. Scarlett
Mr. Cannon
Mr. Taylor
Mr. Villforth

Prepared by: RCEccleston:8/13/86
Cleared by: WGundaker/AHolt:8/13/86
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JBenson:8/13/86

DEPARTMENT OF HEALTH & HUMAN SERVICES

Public Health Service
Centers for Disease Control

Memorandum

Date · August 15, 1986

From Director
Centers for Disease Control

Subject Hemodialyzer Reuse Assessment Report - Recommendations for Action

To The Assistant Secretary for Health

As requested in your memorandum of August 7, we have reviewed the report, "Public Health Service Assessment: Reuse of Hemodialysis Devices Labelled for Single Use Only," as well as the recommendations proposed for future PHS action. We will comment most specifically on those which have been suggested as being the responsibility of CDC.

In general, the report presents an adequate reflection of the state of the art of hemodialyzer reuse practices in the United States.

CDC has been suggested as the responsible agency for (1) standards development, and (2) evaluation of relative morbidity and mortality. In assigning responsibilities in these two areas it must be understood that CDC has expertise to develop certain guidelines and to assess certain problems associated with the reuse of hemodialyzers, but there are areas in which CDC will require significant help from both FDA and NIH.

The following plan for implementing the proposed responsibilities for CDC in relation to the question of dialyzer reuse is submitted for your consideration.

I. GUIDELINES DEVELOPMENT (The term "guidelines" should be substituted for the term "standards" as used in the recommendations.)

A. Empirically based guidelines for:

1. Water quality. Comment:

CDC will develop microbiologic and chemical guidelines for water used to rinse hemodialyzers that are reprocessed as well as for water that is used to prepare chemical germicides for the purpose of disinfection or sterilization of hemodialyzers. CDC will draw upon its own laboratory experience as well as proposed standards of the Association for the Advancement of Medical Instrumentation (AAMI) in formulating these guidelines. Estimated time required - 6 to 12 months.

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2. Disinfectants. Comment:

   CDC will propose minimum concentrations of generic chemical germicides such as formaldehyde that are used for the disinfection or sterilization of hemodialyzers that are to be reprocessed and will review, in collaboration with FDA, current use directions for commercially available chemical germicides that are formulated for the disinfection or sterilization of dialyzers that are reprocessed. The Center for Infectious Diseases and the National Institute for Occupational Safety and Health (NIOSH) will provide expertise in the process. Estimated time required - 12 to 18 months.

3. Appropriate mode and conditions of use. Comment:

   CDC will develop guidelines for manual and automated methods for reprocessing hemodialyzers which will include those tests that should be routinely used to verify adequate functioning of the hemodialyzer. These guidelines will be developed in collaboration with FDA. It is anticipated that the criteria for these guidelines will be based on those developed by AAMI. The time required - 12 to 18 months.

4. Residue exposure and toxicity. Comment:

   CDC will propose a guideline on the minimum amount of residual chemical germicide in reprocessed hemodialyzers that will be allowable and the methods by which chemical residuals are quantitatively determined. Much of the rationale to set the quantitative level of these germicides will be based on the most recent proposal of AAMI. This guideline could be influenced by the results of the proposed consensus conference that may be conducted by NIH on the reuse of hemodialyzers. Time required - initially, 6 to 12 months: updated guideline should NIH elect to convene a consensus conference - 18 to 24 months.

5. Risk of exposure to formaldehyde and other chemical germicides for hemodialysis staff. Comment:

   CDC (NIOSH) has conducted surveys of several hemodialysis centers and has made recommendations on methods to optimally control the amount of airborne exposure to formaldehyde as well as the upper maximum limits of airborne formaldehyde. These studies will be reviewed and guidelines developed. Potential risks to both patients and staff as a result of their exposure to formaldehyde, recent information on formaldehyde carcinogenesis, and options for using germicides other than formaldehyde (all issues which are not fully explored in the current assessment) will be considered in the development of guidelines in this area. This guideline could be influenced by the results of the proposed consensus conference that may be conducted by NIH on the reuse of hemodialyzers. Time required - initially, 6 to 12 months: updated guideline should NIH elect to convene a consensus conference - 18 to 24 months.

6. Effect of reprocessing procedures on hemodialyzer membranes. Comment:

   In collaboration with FDA and NIH, an attempt will be made to develop meaningful guidelines to determine the number of times a dialyzer might be reused as a function of specific dialyzer membrane type, dialyzer reprocessing method, and the type of chemical germicide. A guideline would be established only after full consultation and collaborative development with FDA and NIH. Estimated time - approximately 3 years. (If additional tests are required, these tests might be best conducted by NIH or FDA.)

7. Effective reprocessing on bloodlines and tubing, transducer filters, and dialyzer caps. Comment:

   Currently, CDC surveillance of dialysis-associated diseases done collaboratively with HCFA is able to determine on a yearly basis the number of licensed centers in the United States that reuse hemodialyzers as well as the total number of patients that are in such programs. For calendar year 1986, surveillance questionnaires will be modified so that information can be obtained on the frequency with which bloodlines and dialyzer caps and transducer filters are reused. It should be noted that CDC has historically recommended that transducer filters not be reused. This recommendation is primarily made for the control of viral hepatitis B.

After these data are available, CDC will determine if any meaningful guidelines can be written that would pertain to reuse of bloodlines and tubing, dialyzer caps, and transducer filters. These efforts will be done in collaboration with FDA. It should be anticipated that meaningful guidelines might not be able to be developed in this area. At present no specific reuse information is gathered by the manufacturers of these disposable devices since the manufacturers recommend against their reuse.

B. Prepare guidelines for transmittal to HCFA which will permit HCFA to revise conditions of participation and instructions to State survey agencies.

When the guidelines discussed above are developed, they will be made available to HCFA for their appropriate use. The adaptation of these guidelines for HCFA's purposes and the implementation of HCFA's recommendations may also require that PHS provide several training sessions for HCFA facility surveyors. Time required: 18 to 36 months.

II. EVALUATE RELATIVE MORBIDITY/MORTALITY.

CDC will review its current surveillance system for dialysis-associated diseases. It is anticipated that this system can be used to determine any significant increased risk of hepatitis B, non-A-non-B hepatitis, pyrogenic reactions, and septicemia that is associated with reuse of hemodialyzers. In addition, noninfectious complications such as first-time dialyzer reaction (new dialyzer syndrome) and hemolytic reactions may be able to be determined for possible association with the existence of dialyzer reuse programs in dialysis centers. Time required: 18 to 24 months.

James O. Mason

James O. Mason, M.D., Dr.P.H.
Assistant Surgeon General

DEPARTMENT OF HEALTH & HUMAN SERVICES

Public Health Service

Office of the Assistant Secretary
for Health
Washington DC 20201

SEP 4 1986

Mr. Perry Ecksel
President
National Kidney Patients Association
Suite 102
#2 Park Lane
Feasterville, Pennsylvania 19047

Dear Mr. Ecksel:

I am responding to your July 8 letter to Secretary Bowen in which you express concerns over the reprocessing and reuse of disposable hemodialysis devices.

Let me say at the outset that I fully agree with you that we need to do all that is possible to protect the health and welfare of patients with end-stage renal disease. As you know from past correspondence, there have been a number of studies undertaken to evaluate potential problems associated with the reuse of hemodialysis equipment. The findings to date indicate that when reprocessing is carried out properly, the overall risk to patients of single versus multiple use is about the same.

In response to the growing prevalence of reuse, and to assure that all existing scientific information concerning reuse is considered, the Department's National Center for Health Services Research (NCHSR) and its Office of Health Technology Assessment (OHTA) have performed a formal assessment of the safety, efficacy, and cost-effectiveness of reuse of dialysis equipment. This effort was announced in an April 10, 1986 Federal Register publication, which invited comments and solicited all medical and scientific information that might have a bearing on this subject. That assessment has been completed and recommendations for action by the Public Health Service are under consideration.

In addition to the NCHSR/OHTA study, the Food and Drug Administration (FDA) is conducting under contract a study in three states and the District of Columbia of problems associated with dialysis in general, including reuse. Taken together, these two studies should provide an accurate picture of current clinical practices and an up-to-date scientific baseline from which the Department can decide on an appropriate course of action.

In your letter, you asked about two specific issues: the petition from Senator Heinz to the FDA in which he requests the agency to apply Good Manufacturing Practices (GMP) regulations to reprocessors and facilities that reuse dialysis devices; and whether patients have the basic right to choose whether to undergo hemodialysis where the equipment has been reprocessed, and whether patients are entitled to an opportunity to give informed consent to being treated with reprocessed equipment.

With respect to informed consent and freedom of choice, I believe that such decisions fall within the realm of the physician-patient relationship. With respect to the imposition of GMPs, as you may know sections of the Federal Food, Drug, and Cosmetic Act specifically exempt from regulation "practitioners licensed by law to prescribe or administer drugs or devices and who manufacture, prepare, propagate, compound or process drugs or devices solely for use in the course of their professional practice". This statutory language raises potential legal issues. I can assure you, however, that if the NCHSR/OHTA and FDA studies reveal a public health problem, the Public Health Service or the Health Care Financing Administration will examine all possible options and promptly recommend appropriate action to Secretary Bowen.

I should note that independent of the applicability of GMPs, FDA staff have collaborated with the Association for the Advancement of Medical Instrumentation (AAMI) in the development of a guideline directed to the reuse of dialysis equipment. In essence, the guideline will set forth procedures for the optimal reprocessing of dialysis equipment. The procedures will include tests that a facility can perform to verify the performance characteristics of a reprocessed device prior to its use. This guideline, coupled with AAMI's 1982 standard covering hemodialysis systems, should go a long way toward ameliorating any problems associated with the reuse of dialysis devices.

I appreciate receiving your views about this important public health matter. As the Secretary has previously committed to Senator Heinz, we will take whatever steps are appropriate to ensure high quality end-stage renal disease services, in keeping with our legal mandate and the latest scientific and medical knowledge.

Sincerely yours,

Robert E. Windom, M.D.
Assistant Secretary for Health

cc: Dr. Marshall
Dr. Young

DEPARTMENT OF HEALTH & HUMAN SERVICES
Public Health Service
Washington DC 20201

SEP 5 1986

The Honorable John Heinz
Chairman
Special Committee on Aging
Washington, D.C. 20510

Dear Senator ~~Heinz~~ John:

In light of your concerns about the reuse of hemodialysis devices, I felt that you may want to know the actions that the PHS has recently undertaken with regard to this issue.

I have established the Interagency Task Force on Dialyzer Reuse to advise me with respect to issues related to hemodialyzer reuse. Specifically, the Task Force will review the NCHSR/HCTA recommendations, provide thoughtful consideration of appropriate PHS actions, develop an implementation plan, and monitor the progress of this plan. In addition, this group will provide a focal point for discussion of dialysis issues within the PHS on a continuing basis, provide advice to me and other senior PHS officials, and, as necessary, to other components of the Department.

The Task Force is chaired and staffed by members of my immediate office and also consists of senior representatives from the National Institutes of Health, the Centers for Disease Control, and the Food and Drug Administration, the National Center for Health Services Research/Health Care Technology and the Chief Counsel of the Public Health Service.

I have enclosed a copy of the Charter for the Task Force, its membership roster, and a copy of the draft workplan. At the first meeting on September 4, I gave the group its charge and impressed upon them the importance of their work. I expect to have a PHS implementation plan from this group no later than October 24.

I wish to thank you for you for your continued interest in this important health matter, and will keep you apprised of our progress.

Sincerely yours,

Robert E. Windom, M.D.
Assistant Secretary for Health

Enclosures

Public Health Service

INTERAGENCY TASK FORCE ON DIALYZER REUSE

CHARTER

Purpose

The PHS Interagency Task Force on Dialyzer Reuse, herein referred to as the Task Force, is established by the Assistant Secretary for Health, DHHS, as an interagency group to:

A. provide a focal point for dialyzer reuse issues within PHS;

B. advise the Assistant Secretary for Health with respect to the recommendations emanating from the NCHSR/HCTA assessment on dialyzer reuse entitled "Public Health Service Assessment: The Reuse of Hemodialysis Devices Labeled for 'Single Use Only'", dated August 6, 1986;

C. develop an implementation plan based upon those recommendations agreed to by the Assistant Secretary for Health; and

D. monitor progress of the PHS agencies with regard to progress of the implementation plan.

Scope

To ensure that the Task Force's purpose is carried out, the Task Force will undertake activities that include, but are not limited to, the following:

A. evaluate the recommendations of the NCHSR/HCTA assessment and advise the Assistant Secretary for Health on those recommendations that should be pursued by PHS;

B. establish a PHS Implementation Plan which will identify lead responsibilities within PHS for each of the recommendations accepted by the Assistant Secretary for Health and establish appropriate timetables;

C. monitor the progress of the PHS agencies in the fulfillment of the goals of the implementation plan; and

D. provide advice, on a continuing basis, to the Assistant Secretary for Health, other senior PHS officials, and, at the direction of the Assistant Secretary for Health, other components of the Department on issues related to dialyzer reuse.

Structure

The Task Force will be chaired by the Deputy Director, Office of Health Planning and Evaluation. The Chairman will be assisted by an Executive Secretary.

The members of the Task Force shall consist of a senior representative from each of the following PHS agencies: National Institutes of Health, the Centers for Disease Control, and the Food and Drug Administration. Participants will be designated by the heads of the agencies represented on the Task Force.

In addition, the Director of the National Center for Health Services Research/Health Care Technology Assessment and the Chief Counsel of the Public Health Service, or their designees, shall also be appointed as members of the Task Force. Any necessary resources and staff support needed by the members of the Task Force shall be provided by each of the member agencies or offices.

Meetings

It is expected that the Task Force shall meet regularly, but not less often than quarterly. There will be a need to meet more frequently in the initial phase of the Task Force deliberations. The schedule of meeting dates will be determined by the Chairman, in consultation with the Task Force members.

Reporting

The Task Force shall provide reports on its activities to the Assistant Secretary for Health at least quarterly or more often as necessary.

Duration

The duration of the Task Force shall be eighteen (18) months from the date of approval of this charter. At that time, the Assistant Secretary for Health will evaluate whether the charter for this Task Force should be extended.

Robert E. Windom, M.D.
Assistant Secretary for Health

SEP 3 1986
Date

INTERAGENCY TASK FORCE ON DIALYZER REUSE

ROSTER

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DRAFT

INTERAGENCY TASK FORCE ON DIALYZER REUSE

MASTER SCHEDULE AND WORK PLAN

Date	Action
September 3	Interagency Task Force on Dialyzer Reuse established by the Assistant Secretary for Health
September 4	First meeting of the Task Force
	Charge to the Task Force by the ASH
	Review of the Task Force Charter
	Review and Agree on Work Plan
	Assign Lead Agencies for Discussion of NCHSR/HCTA Assessment Recommendations
	Distribute Agency Comments on NCHSR/HCTA Assessment to all Task Force Members
September 12	Second meeting of the Task Force
	Discussion of Agency Comments on NCHSR/HCTA Assessment
	Discuss and Reach Consensus on Proposed PHS response to NCHSR/HCTA Assessment Recommendations
September 16	Draft sections of "Advice Memo" due to Task Force Executive Secretary from Task Force Members
	Collated Version Distributed to Task Force Members
September 19	Third Meeting of the Task Force
	Final review of Advice Memo to ASH on proposed PHS response to NCHSR/HCTA Recommendations
	Discuss Identification of Lead Agency for Implementation of Recommendations Proposed
	Begin Discussion of Implementation Steps and Appropriate Time Tables
September 23	* **PROGRESS REPORT TO ASH:** Advise ASH on Proposed PHS Actions on Dialyzer Reuse
September 23	Task Force Members provide Implementation Proposals and Time Frames for Distribution

September 26	Fourth Meeting of the Task Force Discuss and Reach Consensus on Implementation Proposals and Time Tables provided by Lead Agencies Consolidate Agency Plans to Draft the PHS Implementation Plan for Dialyzer Reuse Activities HCFA representatives will be invited if appropriate
September 30	Distribute Draft Implementation Plan to Task Force Members
October 3	Fifth Meeting of the Task Force Final Review of PHS Implementation Plan on Dialyzer Reuse Agreement Reached on Tracking System necessary to Monitor Progress
October 10	* **REPORT TO THE ASH:** Implementation Plan for PHS Activities Recommended on Dialyzer Reuse
October 9/17	Sixth Meeting of the Task Force Chairman reports on the ASH comments to the PHS Implementation Plan Revise Implementation Plan as necessary Finalize Tracking System Discussion of schedule for forthcoming meetings

Constituent Name Windom

VIP ROUTING SLIP

RETURN TO: Susan Parma

DATE

TO ML 9/8/86

TO CK 9/10

TO Agency 9/10

TO

COMMENTS: ASAP

FINAL DISPOSITION

☐ CMS Response Sent ______ ☐ NRN

☐ Response into JH for signature on ______

☐ Phone Call and CMS acknowledgement sent ______

☐ Response sent and white cc into JH on ______

NEEDS ADDITIONAL FOLLOW-UP

☐ Yes

☐ No

officials, and, as necessary, to other components of the Department.

The Task Force is chaired and staffed by members of my immediate office and also consists of senior representatives from the National Institutes of Health, the Centers for Disease Control, and the Food and Drug Administration, the National Center for Health Services Research/Health Care Technology and the Chief Counsel of the Public Health Service.

I have enclosed a copy of the Charter for the Task Force, its membership roster, and a copy of the draft workplan. At the first meeting on September 4, I gave the group its charge and impressed upon them the importance of their work. I expect to have a PHS implementation plan from this group no later than October 24.

I wish to thank you for you for your continued interest in this important health matter, and will keep you apprised of our progress.

Sincerely yours,

Robert E. Windom, M.D.
Assistant Secretary for Health

Enclosures

NAPHT
NATIONAL ASSOCIATION OF
PATIENTS ON HEMODIALYSIS
AND TRANSPLANTATION, INC.
THE VOICE OF ALL KIDNEY PATIENTS

211 East 43rd Street
New York, NY 10017
(212) 867-4486

22 September 1986

Honorable Secretary Otis Bowen
Dept. Of Health and Human Services
200 Independence Ave SW
Washington DC 20201

Dear Mr. Secretary,
It has come to our attention that Dr Robert Windom, the Assistant Secretary for Health, has appointed an Interagency Task Force on Dialyzer Reuse. It is chaired by Mr James Friedman of the Office of Health Planning and Evaluation.

Our Executive Director spoke with Mr Friedman this past Thursday to request that we be allowed to attend the meetings of this Task Force. For the past two years we have made every effort to involve the Food and Drug Administration as well as your office and HCFA in this issue which is of such importance to beneficiaries. As you are well aware, there are many questions to be addressed regarding the safety and efficacy of this practice.

We have just been given a report done by the State of California Health Department. They did a random survey of thirty one dialysis facilities in the State. Their findings are shocking and lead us to believe, more than ever, that the reuse of dialyzers must be regulated by the Food and Drug Administration under the auspices of Good Manufacturing Practices.

Some of the more relevant findings are; that most of the facilities are unaware of the quality of their incoming water which is important for hemodialysis as well as for reuse. Only one of the thirty one facilities did any monitoring of pyrogens. It was also found that procedures for diluting the formaldehyde chemical, nominally 37% formaldehyde, into the usuable 1.5% by volume disinfectant chemical solution were incorrect. Testing revealed that the actual concentration was 0.5% which allowed for bacterial growth in both the disinfectant chemical storage container and in the patient dialyzers.

Clearly these and the other findings of this report can lead to a dramatic increase in patient morbidity and mortality.

INSURING ACCESS AND SAFEGUARDING QUALITY OF CARE

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211 East 43rd Street
New York, NY 10017
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Mr Friedman stated that he believed the Public Health Service acts in the interests of beneficiaries and that the discussions the Interagency Task Force were holding were too scientific for patients to grasp. Mr Secretary, dialysis patients must be able to understand sophisticated details of their treatment and disease because they impact so directly on the day to day life of patients. We urge you to ask Mr Friedman to open these meetings to us or at the very minimum provide us minutes of such meetings and a means to communicate with this Task Force on a regular basis.

We look forward to a favorable response.

Sincerely yours,

Paul L Feinsmith
82)

Paul L. Feinsmith
President
cc: Robert Windom, MD
James Friedman Chairman
Sen. John Heinz

DEPARTMENT OF HEALTH & HUMAN SERVICES Public Health Service

Memorandum

Date · SEP 23 1986

From Chairperson
Interagency Task Force on Dialyzer Reuse

Subject Task Force Recommendations on Dialyzer Reuse--DECISION

To Assistant Secretary for Health
Through: ES/PHS __________

In response to your charge, the Interagency Task Force on Dialyzer Reuse has deliberated on the recommendations set forth by the NCHSR/HCTA Assessment on Dialyzer Reuse. The intent of these discussions has been to evaluate the NCHSR/HCTA recommendations and provide you with advice on what we believe to be the appropriate PHS actions.

The recommendations below represent a consensus of the Task Force. Please indicate your decision with respect to each recommendation.

NCHSR RECOMMENDATION:

I. STANDARDS DEVELOPMENT

A. Empirically based Standards are necessary for:

1. water quality,
2. disinfectants,
3. appropriate mode and conditions of use,
4. residue exposure and toxicity, and
5. risk exposure for staff.

TASK FORCE RECOMMENDATION:

The Public Health Service will recommend guidance for procedures for reprocessing of hemodialyzers.

The Association for the Advancement of Medical Instrumentation (AAMI) has developed a draft document, "Recommended Practice for the Reuse of Hemodialyzers." These guidelines are the result of a consensus among members of the nephrology community, the medical device industry, scientific and professional societies, as well as representatives from FDA and CDC. Many of the [illegible] that apply to the safe reprocessing of dialyzers have

Memorandum

Date SEP 23 1986

From Chairperson
Interagency Task Force on Dialyzer Reuse

Subject Task Force Recommendations on Dialyzer Reuse--DECISION

To Assistant Secretary for Health
Through: ES/PHS __________

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The Association for the Advancement of Medical Instrumentation (AAMI) has developed a draft document, "Recommended Practice for the Reuse of Hemodialyzers." These guidelines are the result of a consensus among members of the nephrology community, the medical device industry, scientific and professional societies, as well as representatives from FDA and CDC. Many of the criteria that apply to the safe reprocessing of dialyzers have been reviewed by the Task Force and can be incorporated into PHS guidance. Specifically, this guidance will include recommendations for microbiologic and chemical quality of water used in the reprocessing systems, concentration of chemical germicides that are used to sterilize or disinfect hemodialyzers, tests for germicidal potency, as well as tests for residual chemical germicide after the reprocessing.

With respect to risk exposure to staff, maximum limits for chemical germicides (used in the reprocessing of hemodialyzers) in the work place, especially formaldehyde, will be recommended along with procedures and guidance for minimizing environmental exposure to staff. There is no guidance in this regard in the proposed AAMI guidelines. The PHS guidance will be limited to positions already developed by NIOSH and/or OSHA.

Concur ____________ Nonconcur ____________ Date SEP 30

Other ____

____

NCHSR RECOMMENDATION:

I. STANDARDS DEVELOPMENT

A. Empirically based Guidelines are necessary for:

6. effect on hemodialyzer membranes

TASK FORCE RECOMMENDATION:

Further studies are needed to determine the integrity of dialyzers after exposure to chemical germicides.

The effect of chemical germicides on hemodialyzer membranes has been studied by a number of investigators. There remains a question of dialyzer membrane compatibility. The Task Force recommends that the marketed chemical germicides should be assessed by the manufacturer of the germicide. They will be asked to provide suitable data on germicide-membrane compatibility. CDC is currently conducting limited studies of this nature. These should continue.

Concur ____________ Nonconcur ____________ Date SEP 30

Other ____

____

NCHSR RECOMMENDATION:

I. STANDARDS DEVELOPMENT

A. Empirically based Standards are necessary for:

7. effect on blood lines and tubing, transducer filters, and dialyzer caps.

TASK FORCE RECOMMENDATION:

PHS should collect data on the reuse of associated dialyzer supplies to provide the basis for further study and possible guideline development.

PHS has determined the number of dialysis centers that reuse hemodialyzers. All centers that reuse dialyzers also reuse dialyzer (filter) caps. It appears that some centers that reuse hemodialyzers also reuse blood lines and transducer filters. The Task Force recommends that the PHS should determine the number of centers which reuse blood lines and transducer filters. The safety of this practice, when specific conditions and guidelines are practiced, should be evaluated. This will provide guidance as to the need for further study and possible guideline development.

Concur ______________ Nonconcur ______________ Date ______________

Other ____

NCHSR RECOMMENDATION:

B. Prepare guidelines for transmittal to HCFA which will permit HCFA to revise conditions of participation and instructions to State survey agencies.

TASK FORCE RECOMMENDATION:

PHS should prepare guidance for reuse of hemodialyzers and transmit these to the HCFA.

The Task Force believes that this approach is the most effective and efficient means to get appropriate guidance in place. The Task Force also deems it imperative that public comment be solicited on the proposed guidance. HCFA's rulemaking process is expected to include a public comment period. This would satisfy the Task Force's intent to solicit public comment.

In the absence of a HCFA-initiated comment period, however, the Task Force suggests that before PHS finalizes its guidance and sends it to HCFA, public comment on this guidance should be sought. Under such circumstances, PHS should publish a "Notice of Availability" in the Federal Register that solicits comment on the guidance that will then be transmitted to HCFA.

Concur ____________ Nonconcur ____________ Date SEP 90

Other ______________________________

____

NCHSR RECOMMENDATION:

II. EVALUATE RELATIVE MORBIDITY/MORTALITY

A. Infectious Complications.

TASK FORCE RECOMMENDATION:

PHS will continue to perform surveillance for certain dialysis-associated infections and diseases. Further research will be conducted in this area.

In collaboration with HCFA, CDC will determine the number of centers that reuse hemodialyzers and any significant increased risk of hepatitis B, non-A-non-B hepatitis, pyrogenic reactions, and bacteremia that may be associated with reuse of dialyzers. Pyrogenic reactions and bacteremia specifically associated with the practice of reuse will be determined by the NIH-HCFA study (see Section IV-B).

Concur ____________ ~~Nonconcur~~ ____________ Date SEP 90

Other ______________________________

____

NCHSR RECOMMENDATION:

II. EVALUATE RELATIVE MORBIDITY/MORTALITY

B. Non-infectious complications.
C. Other adverse reactions.

TASK FORCE RECOMMENDATION:

Studies should be conducted to identify and quantify non-infectious complications of dialyzer reuse.

A discussion of this recommendation is included in Section IV-B.

NCHSR RECOMMENDATION:

III. REPROCESSING

A. Apply Good Manufacturing Practices

1. dialyzers, and
2. other components.

TASK FORCE RECOMMENDATION:

Good Manufacturing Practices (GMP's) should not be applied to reused dialyzers.

The Food and Drug Administration's GMP regulations serve as the basis for a quality assurance program directed to and tailored specifically for medical device manufacturers. This is in keeping with the spirit and intent underlying the 1976 Medical Device Amendments to the Federal Food, Drug, and Cosmetic Act. Although a case might be made for applying certain quality assurance controls to the reprocessing of hemodialyzers and other disposable dialysis devices to ensure their safe use, the Task Force believes imposition of GMP controls on clinicians and dialysis facilities would be inappropriate for the following reasons:

- Applying GMPs would not be the most efficient use of Department Resources. The most appropriate and cost-effective approach for ensuring that dialysis facilities adhere to recommended practices is to apply guidelines through the Medicare program as described in Section I-B above.

- The 1976 device law specifically exempts practitioners from certain regulatory requirements unless their use of a device extends beyond ordinary professional practice and into commercial activity. The extend to which the exemption applies to dialysis facilities that perform reprocessing and reuse for treatment of their own patients and are not engaged in commercial distribution of devices is unclear.

- Enforcement of GMP regulations in dialysis facilities would thus pose a risk of FDA intruding on the practice of medicine, raising a legal and regulatory issue that would only encumber efforts to safeguard the health of dialysis patients. HCFA sponsored onsite inspections on dialysis centers would be as effective and would not raise jurisdictional questions.

Concur ______________ Nonconcur ______________ Date ____________

Other ____

____

NCHSR RECOMMENDATION:

III. REPROCESSING

B. Develop monitoring program for joint application through HCFA instructions to State survey contractors and program participation conditions.

TASK FORCE RECOMMENDATION:

If requested, PHS should provide technical help for training HCFA personnel.

PHS will be available upon request to provide technical assistance in developing surveyor guidelines for State agencies. This could take the form of training for inspectors and/or technical support by PHS to HCFA as part of its ongoing training program for State survey personnel.

Concur ______________ Nonconcur ______________ Date ____________

Other ____

____

NCHSR RECOMMENDATION:

C. Performance assessment testing program for frequency of reuse:

1. volume,
2. pressure, and
3. clearance.

TASK FORCE RECOMMENDATION:

Performance assessment testing program for frequency of reuse will be a part of the guidelines which the Task Force believes should be transmitted to HCFA. (See I-A and I-B above.)

Concur ______________ Nonconcur ______________ Date ____________

Other ____

____

NCHSR Recommendation:

IV. CLINICAL STUDIES

A. Determination of clinical indicators for:

1. single use, and
2. multiple use.

B. Ascertain significance of residual disinfectant levels for:

1. anti-N-like antibodies,
2. clotting/heparin, and
3. other toxicities.

TASK FORCE RECOMMENDATION:

PHS will continue to perform surveillance for certain dialysis-associated diseases. Further research will be conducted in this area.

Dialysis-associated diseases including those changes which might be considered resulting from the practice of reusing dialyzers will be examined under a research effort developed by NIH. NIH developed an interagency agreement with HCFA which provided the mechanism by which a portion of the data could be collected in concert with HCFA. The following steps have been taken:

- o A Request for Proposals (RFP) was initiated, and it is anticipated that a contract will be awarded in May 1987. The cost of this effort is estimated to be in the range of $1.2 million to $1.5 million per year for a period of five years.

- o The data will be collected in two general forms:

  -- A cross-sectional analysis similar to that which is currently being conducted by the CDC and which will be closely coordinated with that group. This offers a limited amount of information, and therefore, some of the details necessary to answer specific questions may not be available during such a review.

  -- Based on valid statistical and epidemiological data, a sample will be selected from which a more indepth review will be conducted. This will represent a very well-defined segment of the population. Detailed questions of this particular population will include:

    - infectious complications;

- non-infectious complications such as first-use syndrome, hemolysis, anemia, vascular disease, etc.;
- the presence or absence of dialyzer reuse in the center;
- indicators for single versus multiple use; and
- the incidence and types of malignancies.

A Steering and Planning Committee will be convened, consisting of leaders from the academic, clinical, and governmental groups. They will be charged with the responsibility for defining the range of topics to be considered, the exact questions to be asked, and the design of the questionnaires.

Concur __________ Nonconcur __________ Date __________

Other ____

____

NCHSR RECOMMENDATION:

V. EDUCATIONAL MATERIAL

A. Support a Consensus Conference to provide educational material for the dialysis community on the indications and implications for single versus multiple use of dialyzers and associated components.

TASK FORCE RECOMMENDATION:

The Task Force believes that it is premature to support a consensus conference at this time. However, a planning conference should be held to review the current status of ESRD therapy and to make recommendations for further studies.

The NIH is in the process of developing a planning conference which will provide a forum for the academic, clinical, and governmental community to discuss the treatment of patients with ESRD. Included among the topics will be the type of dialysis therapy, the mode of dialysis (including reuse), transplantation, and the management of complications of both dialysis and transplantation. The group which will plan the agenda and make recommendations for the participants is scheduled for its first meeting on October 8, 1986, at the NIH. Representatives from the academic, clinical, and concerned governmental agencies have been invited.

It is anticipated that this planning conference will be held in late 1987 under the joint sponsorship of the NIH and the Office of the Assistant Secretary for Health.

Concur __________ Nonconcur __________ Date __________

Other ____

____

NCHSR RECOMMENDATION:

V. EDUCATIONAL MATERIAL

B. Develop educational material suitable for use by patients in understanding implications of single versus multiple use.

TASK FORCE RECOMMENDATION:

The public should be informed about the potential benefits and risks of hemodialyzer reuse, through the development of patient education materials.

Virtually all dialysis centers make written material available to patients undergoing hemodialysis treatments, yet, there is inconsistency in the depth and quality of patient education. In particular, it is unclear as to the extent dialysis centers currently provide information or special training on reuse.

The Task Force believes this is an area that deserves attention. Materials to inform patients about the potential benefits and risks of reuse should be developed (perhaps in conjunction with HCFA), based on the results of the NIH conference and FDA's consumer education program. (It should be noted that Congress is presently considering legislation that would require ESRD facilities that reuse dialysis equipment to inform patients about benefits and risks, and to offer them the freedom to choose whether or not to accept treatment at facilities engaging in reuse.)

Concur __________ Nonconcur __________ Date __________

Other ____

____

Based on your decisions regarding the Task Force recommendations stated above, we will develop a PHS Implementation Plan that will encompass these goals. Our Implementation Plan will identify the agencies responsible for each approved recommendation and a time table for accomplishing these activities. Subsequent to the development of this Plan, the Task Force will monitor the progress of the Implementation recommendations.

James M Friedman

James M. Friedman

NEW YORK CHAPTER

BOX 6044
NEW YORK, N.Y. 10150
(212) 268-5365

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NATIONAL ASSOCIATION OF PATIENTS
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October 6th, 1986

Senator John Heinz
United States Senate
Special Committee on Aging
Washington, D.C. 20510

Dear Senator Heinz,

One of our New York Chapter members who had arranged dialysis treatment in Maine during his summer vacation this past August, received insufficient information from the unit in advance of his visit concerning reuse. He had scheduled 2 treatments but only learned about their reuse policy after receiving the first treatment.

He informed them that he would not accept the same dialyzer a second time, but would gladly pay for a new one. They refused, thus causing him much difficulty in arranging his vacation schedule. In fact the result was that he had to dialyze at another unit in Boston 2 days in a row and then cut short his whole vacation.

He was very upset about this matter and wondered if he could do something for other, future patients, who might find themselves in the same situation at another time.

The patient's name and address is:

Mr. Jean-Claude Barre
125-10 Queens Boulevard-Apt. #1224
Kew Gardens, New York 11415
(H) 718-544-5508
(O) 212-986-1413

The unit in questions is:

The Lewiston/Auburn Kidney Center
710 Main Street
Lewiston, Maine 04240
(207) 784-2269

It's interesting that the decision not to allow Mr. Barre a new kidney, came from the director of nursing, Ms. Lynn Lenhert and not the medical director.

Should you wish more information on this matter, I have copies of all the correspondence of Jean-Claude Barre from May 21st through September 1st as well as a copy of their form re reuse.

NEW YORK CHAPTER

BOX 6044
NEW YORK, N.Y. 10150
(212) 238-5385

NAPHT INC.
NATIONAL ASSOCIATION OF PATIENTS
ON HEMODIALYSIS AND TRANSPLANTATION

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October 6th, 1986-Senator John Heinz-Page Two

While this may not appear to be the most dramatic of situations regarding reuse of dialyzers, it does point out the insidious behavior associated with reuse. Jean-Claude Barre had made quite an effort arranging his vacation plans, not to go to a reuse unit. Many units that he wrote to told me that they do reuse, and he didn't apply further to them. The Lewistown/Auburn never mentioned the matter until all plans were made and he was on the premises. They treated him badly and made him feel like a second class citizen even though he agreed to pay for a new dialyzer.

We've written to the medical director of this unit (in a letter of September 16th, 1986) asking him for an explanation of this situation and telling him that we'd contact you if we don't hear from him within two weeks and that we'll suggest to our members to boycott this unit when making summer plans. That was 3 weeks ago and he's not responded to our letter.

We'd appreciate it if you would contact this unit and HCFA and let them know that they did not practice informed consent, had non-medical personnel insist on reuse of a transient patient, and disregarded his rights as a patient and a human being. Anything else you could do to improve their posture would be appreciated.

Should you wish more information about this situation, let me know and I'd be glad to provide it.

Thank you for being an interested source of help for kidney patients caught in this bind.

Sincerely,

Gerald H. Dessner
Secretary
New York Chapter
NAPHT, INC.

APPENDIX IV.

CORRESPONDENCE REGARDING A DIALYSIS FACILITY REQUIREMENT TO REUSE BLOODLINES

BIO-MEDICAL APPLICATIONS OF TAKOMA PARK
247 Carroll Street, Washington, D.C. 20012
(202) 723-8010

July 17, 1986

Dear

As you know we have been a reuse facility for some time. There are advantages to both dialyzer and line reuse. The major advantage to dialyzer reuse is the decrease in first use dialyzer syndrome or allergic reaction. Line reuse reduces the incidences of plasticizers (small particles from the inner lining of the blood lines) from being infused into the patient's blood stream.

With this letter, we are providing you a thirty (30) day notice of our intent to start blood line reuse on those patient's not reusing blood lines.

If you elect not to reuse blood lines, we will be glad to assist you in relocating to another facility.

It will be necessary to have a new hemodialysis consent form signed. If after the thirty (30) day notice has passed you present yourself for treatment and have not signed a new hemodialysis consent form, you will have expressed implied consent for treatment. This consent will include both dialyzer and blood line reuse.

Should you have any concerns or questions about the reuse program, we will be glad to meet with you on an individual basis.

Sincerely yours,

Benjamin Hernandez, M.D.
Medical Director

Mark Casner, Administrator

cc: patient's record

DEPARTMENT OF HEALTH & HUMAN SERVICES REGION III

~6 23

Memorandum

Date AUG 05 1986

From Associate Regional Administrator
Division of Health Standards and
Quality, Region III

Subject Issue regarding reuse of the hemodialyzer
and "blood lines used for kidney dialysis
treatment-Enforcement of applicable federal regulations

To Acting Director
Office of Survey and Certification

The National Kidney Association forwarded the attached letter dated June 13, 1986, from Bartlett S. Fleming, Associate Administrator for Management and Support Services to Senator John Heinz to our office.

Please refer to page two, paragraph three, which states, "Though HCFA's policy has always been that the decision to reuse is a medical practice issue, which should be decided by a patient's physician, we do not, and will not, tolerate facilities which "force" their patients to reuse at the risk of being denied treatment. We will continue to monitor ESRD facilities as part of our survey and certification process and will investigate all patient complaints."

Robert Rosen, Chairman of The National Kidney Patients Association has telephoned our office regarding the above correspondence. He wanted to know how we plan to enforce this statement by Mr. Fleming. He received the correspondence from Senator Heinz's staff and was advised to have patients share it with their physicians.

In addition, we received the attached complaint referral from the Washington, D.C., state agency regarding reuse of blood lines at Bio-Medical Applications (BMA) of Takoma, Park, Provider Number 09-2506. The facility had indicated to patients that they will assist them to transfer to other renal dialysis units if they elect not to use reused blood lines. Patients are required to respond within thirty (30) days receipt of the notification. We do not feel that the above represents appropriate justification for transfer of patients.

Are we prepared to take the position that we will terminate providers who force patients to reuse blood lines and hemodialyzers by giving them no choice except to transfer to another provider if available?

Claudette V. Campbell for

Robert J. Taylor

Attachments

AUG 15 1986

Acting Director
Health Standards and Quality Bureau

Subject Reuse of Hemodialyzers and Blood Lines Used for Kidney Dialysis
(Robert Taylor's Memorandum Dated August 5, 1986)

Regional Administrator
Region III

This is in response to Robert Taylor's recent memorandum requesting review of a recent reuse policy issued by the Bio Medical Applications (BMA) of Takoma Park dialysis facility. BMA of Takoma Park informed its patients that it will begin reusing blood lines as a standard practice in its dialysis procedure and requested its patients sign a reuse consent form. The facility indicated that it would assist patients in transferring to other dialysis units if the patients elected not to reuse the blood lines. The facility further stated that failure of a patient to sign a consent form within 30 days would constitute [illegible] treatment at the facility. Your staff did not feel that this policy represents appropriate justification for the transfer of patients.

The decision to reuse dialyzers and other disposables is a medical practice concern that must be made by the attending physician and the medical director of the dialysis facility. If these individuals determine that reuse is a safe practice, it is up to the patient to accept the practice or seek care from another physician or facility.

BMA of Takoma Park has offered to assist patients in relocating to another facility if they do not want to accept the reuse policy. Therefore, we do not believe that this policy represents an inappropriate transfer burden on the patients. No adverse action against the facility should be taken because of the implementation of the reuse policy.

Thomas G. Morford

RECEIVED
AUG 05 1986

RECEIVED
AUG

MEDICARE

[FACSIMILE OF AUGUST 15, 1986 MEMO FROM MORFORD]

Date: AUG 15 1986

From: Acting Director
Health Standards and and Quality Bureau
[Health Care Financing Administration]

Subject: Reuse of Hemodialyzers and Blood Lines Used for Kidney Dialysis
(Robert Taylor's Memorandum Dated August 5, 1986)

To: Regional Administrator
Region III
[Health Care Financing Administration]

This is in response to Robert Taylor's recent memorandum requesting review of a recent reuse policy issued by the Bio Medical Applications (BMA) of Takoma Park [Washington, D.C.] dialysis facility. BMA of Takoma Park informed its patients that it will begin reusing blood lines as a standard practice in its dialysis procedure and requested its patients sign a reuse consent form. The facility indicated that it would assist patients in transferring to other dialysis units if the patients elected not to reuse the blood lines. The facility further stated that failure of a patient to sign a consent form within 30 days would constitute implied consent if he/she intended to continued receiving treatment at the facility. Your staff did not feel that this policy represents appropriate justification for the transfer of patients.

The decision to reuse dialyzers and other disposables is a medical practice concern that must be made by the attending physician and the medical director of the dialysis facility. If these individuals determine that reuse is a safe practice, it is up to the patient to accept the practice or seek care from another physician or facility.

BMA of Takoma Park has offered to assist patients in relocating to another facility if they do not want to accept the reuse policy. Therefore, we do not believe that this policy represents an inappropriate transfer burden on the patients. No adverse action against the facility should be taken because of the implementation of the reuse policy.

Thomas G. Morford
[Acting Director]
[Health Standards and Quality Bureau]
[Health Care Financing Administration]

AARP

August 18, 1986

LEGAL COUNSEL FOR THE ELDERLY
1331 H Street, N.W., Room 1005
Washington, DC 20005
(202) 234-0970

DISTRICT OF COLUMBIA OFFICE ON AGING

Mr. Mark Casner
Administrator
Bio-Medical Applications of Takoma Park
247 Carroll Street, N.W.
Washington, D.C. 20012

Re: Reuse of Blood Lines

Dear Mr. Casner:

Please be advised that our office represents several patients of Bio-Medical Applications of Takoma Park. They refuse to reuse blood lines. On their behalf, I request that they be allowed to continue to use new blood lines for each dialysis treatment.

Under federal law you cannot transfer or discharge a patient because he or she refuses to reuse blood lines. Pursuant to 42 C.F.R. § 405.2138(b)(2), a facility can transfer or discharge a patient only for medical reasons, his welfare or that of other patients, or for nonpayment of fees. None of these grounds are applicable here. Moreover, The Health Care Financing Administration of the United States Department of Health and Human Services has recently stated that it does not, and will not, tolerate facilities which "'force' their patients to reuse at the risk of being denied treatment." (See attached letter of Bartlett S. Fleming, Associate Administrator for Management and Support Services, to Senator John Heinz, dated June 13, 1986.)

I request that you respond to this request by Monday afternoon. We intend to file a complaint for injunctive relief, and a motion for a temporary restraining order in United States District Court no later than tuesday if you refuse to allow patients to use new blood lines if they so choose.

Finally, please consider this letter as notice that those patients who have not already used reused blood lines do not now consent to reuse.

American Association of Retired Persons 1909 K Street, N.W., Washington, D.C. 20049 (202) 872-4700

John T. Denning *President* Cyril F. Brickfield *Executive Director*

I look forward to your cooperation.

Sincerely,

Michael R Schuster

Michael R. Schuster
Director of Litigation

Encl.

INFORMATION ON THE RE-USE OF DISPOSABLE BLOOD LINES IN DIALYSIS

End Stage Renal Disease patients use plastic tubing to carry their blood to and from dialyzers. Although the blood lines are manufactured for "single use only", many dialysis centers re-use blood lines, cleaning them with formaldehyde between each use. On March 6, 1986 the Special Committee on Aging of the U.S. Senate held hearings on reuse. They found, "Tens of thousands of dialysis patients may be exposed to dangerous and unnecessary risks in the multiple use of disposable dialysis devices.... Dialysis patients who submit to reuse often are not adequately informed of the risks, and many are denied freedom of choice on whether to reuse or not.... There are no uniform and enforceable standards to ensure the safety and efficacy in the reprocessing and reuse of disposable dialysis devices."

No studies have ever been completed to show that reuse of blood lines was safe. Dr. James Beall of the US Department of Energy has written that the formaldehyde exposure in dialysis patients can result in sensitation, eosinophilsa and chromosomal damage. Formaldehyde is associated both with cancer and with organ damage. When inadequate concentrations of formaldehyde are used in sterilization, other problems develop; 14 patients died in a dialysis facility in Baton Rouge, Louisiana due to contamination of water by mycobacteria when formaldehyde concentrations were too low. Dr. John Marshall, director of the National Center for Health Services Research and Technology Assessment, Public Health Service, initially tesitfies before Congress that there was no evidence of any health hazard in the re-use of kidney devices. However, on July 8, 1986, he wrote a memorandum stating that the testimony was inaccurate and misleading; information he gained subsequent to the hearing led him to conclude that further clinical studies were needed as to the safety of reuse, and there are inadequate standards and guidelines for disinfection. Patients report that they have seen reused blood lines break and disconnect from the kidneys, causing patients' blood to spill.

Under federal regulations, patients who are on Medicare have a right to participate in plans made for their treatment, and they have a right to informed consent. Bartlett Fleming, Associate Administrator for Management and Support Services, Health Care Financing Administration, wrote in a letter to Senator John Heinz on June 13, 1986 "we do not, and will not, tolerate facilities which 'force' their patients to reuse at the risk of being denied treatment."

Despite the above problems, BioMedical Applications of Takoma Park sent patients a letter on July 17 stating that the patients would have to consent to blood line reuse within 30 days or relocate to another facility. The notice does not inform patients of the risks involved and to date, patients have not been given any relocation assistance. At least four patients are refusing consent. They do not want to be transferred to a different facility because they have been at their current location for long periods of time (eight years), they would have difficulty travelling to another facility, and they know it is illegal for them to be transferred or discharged for nonconsent.

Biomedical Applications of Takoma Park has had a history of failure to comply with health and safety standards. For example, in inspection reports December and February 1985, the Department of Health and Human Services found that bacteria contaminated the water and the facility had not taken steps to prevent the recurrence; that staff were not properly trained in sterilization or reprocessing of equipment; and that a brownish color fluid was found in reprocessed dialyzers and blood tubing.

Bibliography

Hearing before the Special Committee on Aging, United States Senate, "Disposable Dialysis Devisces: Is Reuse Abuse?", March 6, 1986, Serial No. 99-16

Memorandum from Dr. John Marshall, Director , National Center for Health Services Research and Health Care Technology Assessment, July 8, 1986 to Assistant Secretary for Health, DHHS regarding hemodialyzer reuse.

Statement of Deficiencies and Plan of Correction for BMA Takoma Park, Department of Health and Human Services, December 13 and February 8, 1985.

AARP

LEGAL COUNSEL FOR [illegible]
1331 H Street, N.W., Room [illegible]
Washington, DC 20005
(202) 234-0970

DISTRICT OF COLUMBIA OFFICE ON AGING

September 8, 1986

Mr. Robert J. Taylor
Department of Health and Human Services
Health Care Financing Administration
Associate Regional Administrator
Division of Health Standard and Quality
Region III
Philadelphia, PA 19101

Re: Bio-Medical Applications of
Takoma Park
ESRD Identification No.: 09-2506

Dear Mr. Taylor:

Our office represents four dialysis patients (Frederick Deal, Robert Hardy, Barbara White and Harold Cooley) of the Bio-Medical Applications of Takoma Park (BMATP) facility, located at 247 Carroll Street, N.W. in Washington, D.C. On or about July 22, 1986, they received a notice from BMATP, dated July 17, 1986.

The July 17th notice stated in part:

> With this letter, we are providing you a thirty (30) day notice of our intent to start blood line reuse on those patient's (sic) not reusing blood lines.
>
> If you elect not to reuse blood lines, we will be glad to assist you in relocating to another facility.
>
> It will be necessary to have a new hemodialysis consent form signed. If after the thirty (30) day notice has passed you present yourself for treatment and have not signed a new hemodialysis consent form, you

SEP 11 [illegible]

> will have expressed implied consent for treatment. This consent will include both dialyzer and blood line reuse.

(July 17th letter attached as Exhibit "A.")

Nowhere in this letter is there mention of possible risks associated with reuse. Our clients do not consent to reuse. (See letter to Benjamin Hernandez, M.D., Medical Director of BMATP, dated September 4, 1986, attached as Exhibit "B.")

Since three of our clients will not consent to reuse, and will not use reused dialyzers or blood lines (Mr. Cooley decided to accept reused dialyzers and blood lines pending the resolution of this matter), they have been forced to seek dialysis treatment temporarily at hospital renal dialysis centers.

On August 20, 1986, our clients filed a lawsuit in United States District Court for the District of Columbia, challenging BMATP's reuse policy. On August 25, 1986, U.S. District Judge George Revercomb denied our client's application for a temporary restraining order, in part, because they did not first seek to resolve this matter through the Health Care Financing Administration (HCFA). See, e.g., 42 C.F.R. § 405.2138 (e)(1985). 1/ Therefore, they are now requesting that the HCFA investigate their complaint and provide them with appropriate relief. Our clients contend that BMATP's reuse policy violates several federal regulations.

First, because BMATP's reuse policy does not allow our clients any choice (except to be involuntarily discharged), BMATP is in violation of Section § 405.2138 (b)(2) of Title 42 of the Code of Federal Regulations, which provides that dialysis patients may not be involuntarily discharged or transferred except for medical reasons, nonpayment of fees or the patient's welfare or that of others. Our clients contend that none of these grounds are applicable here. The reason why BMATP, and its parent corporation, National Medical Care, Inc., are adopting a policy of reuse, is purely economic. Indeed, in 1978

1/ They have complained to the District of Columbia Department of Consumer and Regulatory Affairs, Service Facility Regulation Administration, which in turn contacted HCFA. HCFA has not formally responded to this complaint.

Congress authorized the Secretary of Health and Human Services to "experiment" with the cost effectiveness and medical appropriateness of reusing dialyzers in home dialysis. See 42 U.S.C. § 1395 rr(f)(17).

Whether or not reuse is safe, an issue not resolved within the scientific community, may involve "medical judgment." However, the absolute policy of reuse for all patients, which is at issue in our clients' case, is an economic decision not a medical one. It is clear that BMATP is not adopting a reuse policy because reuse is better or safer than single use. The decision is based purely on economic considerations. For the foregoing reasons, we request that HCFA find BMATP in violation of 42 C.F.R. § 405.2138 (b) (2).

Second, our clients contend that BMATP is in violation of Sections 405.2137(a)(3), (b)(1), and (b)(3), and 405.2138(b)(1), and (c), of Title 42 of the Code of Federal Regulations. These sections require an end-stage renal disease facility to: 1) give due consideration to a patient's preferences in the development of his or her care plan; 2) afford a patient the opportunity to participate in the planning of his or her medical treatment and to refuse to participate in experimental research; and 3) treat a patient with consideration, respect, and full recognition of his or her individuality and personal needs. BMATP's absolute policy of reuse does not allow for any individualized treatment, as required by the above provisions. Our clients' preferences have been totally ignored, much less given "due consideration." Moreover, BMATP has not fully informed them of the risks associated with reuse. The July 17th notice mentions nothing about the known health risks associated with reuse. If they present themselves for treatment at BMATP, the facility will construe their action as "implied consent" to reuse of dialyzers and blood lines.

Our clients have legitimate concerns about the health risks associated with reuse of dialyzers and blood lines. Not only has the D.C. Department of Consumer and Regulatory Affairs, (DCRA) Service Facility Regulation Administration, consistently cited BMATP for deficiencies in its reuse procedures and practices (e.g., inadequate staff training, and giving one patient's reprocessed dialyzer or blood lines to another patient), DCRA has also concluded preliminarily in a study of District of Columbia hemodialysis facilities that there is a higher incident rate of blood infection and arterial blood tubing malfunction in facilities that practice reuse. Consequently, whether the reuse of disposable hemodialysis devices is itself a safe and sound medical practice, the reports and study mentioned above demonstrate that there has been very poor quality control in the reprocessing of disposable dialysis devices.

Moreover, the DCRA study indicated that malfunctioning in arterial blood tubing is the result of poorly manufactured tubing. The tubing found most likely to malfunction is the same as that used by BMATP, that is, tubing manufactured by Erika, a subsidiary of National Medical Care, Inc. (The relevant excerpts from the DCRA, SFRA, inspection reports and from the DCRA study, are attached as exhibits "C" and "D" to this letter.)

Finally, BMATP's policy of "forced" consent to reuse violates the Secretary's regulations pertaining to informed consent, and HCFA's policy on consent. Pursuant to section 46.116 of Title 45 of the Code of Federal Regulations, human subjects of research conducted or sponsored by the Department of HHS have a right to refuse to participate in an experiment without losing any benefits to which they are otherwise entitled. As noted above, Congress in 1978 mandated that the Secretary of the Department of Health and Human Services study the medical appropriateness and safety of cleaning and reusing dialyzers by home dialysis patients. Although a partial study was done under the auspices of the National Institutes on Health, no long term clinical study was done. Nor has the Secretary submitted a full report to Congress as mandated under the 1978 legislation. The fact that reuse has not been determined medically appropriate for home dialysis patients means that it cannot be considered medically appropriate for patients of freestanding facilities. Therefore, if HCFA permits reuse, it should be under the same safeguards that apply to subjects of government sponsored research, including informed consent as defined in 45 C.F.R. § 46.116. HCFA's Associate Administrator for Management and Support Services, Barlett S. Fleming, indicated that HCFA does permit patients a choice:

> Though HCFA's policy has always been that the decision to reuse is a medical practice issue, which should be decided by a patient's physician, we do not, and will not, tolerate facilities which "force" their patients to reuse at the risk of being denied treatment. We will continue to monitor ESRD facilities as part of our survey and certification process and will investigate all patient complaints.

See letter to U.S. Senator John Heinz, dated June 13, 1986, attached hereto as Exhibit "E."

I would appreciate your prompt attention to this matter since our clients desire to return to BMATP soon.

Sincerely,

Michael R. Schuster

Michael R. Schuster
Director of Litigation

MRS:lg

Enclosures

cc: U.S. Senator John Heinz ✓
Frances Bowie, Administrator, District of Columbia Department of Consumer and Regulatory Affairs, Service Facility Regulation Administration
David Clarke, Chairman, D.C. City Council

EXHIBIT "A"

Exhibit "A"

BIO-MEDICAL APPLICATIONS OF TAKOMA PARK

247 Carroll Street, Washington, D.C. 20012
(202) 723-8010

July 17, 1986

Dear Mrs. Barbara White.

As you know we have been a reuse facility for some time. There are advantages to both dialyzer and line reuse. The major advantage to dialyzer reuse is the decrease in first use dialyzer syndrome or allergic reaction. Line reuse reduces the incidences of plasticizers (small particles from the inner lining of the blood lines) from being infused into the patient's blood stream.

With this letter, we are providing you a thirty (30) day notice of our intent to start blood line reuse on those patient's not reusing blood lines.

If you elect not to reuse blood lines, we will be glad to assist you in relocating to another facility.

It will be necessary to have a new hemodialysis consent form signed. If after the thirty (30) day notice has passed you present yourself for treatment and have not signed a new hemodialysis consent form, you will have expressed implied consent for treatment. This consent will include both dialyzer and blood line reuse.

Should you have any concerns or questions about the reuse program, we will be glad to meet with you on an individual basis.

Sincerely yours,

Benjamin Hernandez, M.D.
Medical Director

Mark Casner, Administrator

cc: patient's record

EXHIBIT "B"

AARP

September 4, 1986

LEGAL COUNSEL FOR THE ELDERLY
1331 H Street, N.W., Room 1005
Washington, DC 20005
(202) 234-0970

DISTRICT OF COLUMBIA OFFICE ON AGING

Benjamin Hernandez, M.D.
Bio-Medical Applications
of Takoma Park
247 Carroll Street, N.W.
Washington, D.C. 20012

Dear Dr. Hernandez:

As you are aware, our office represents Barbara White, Robert Hardy, and Frederick Deal. You recently sent them letters asking whether they planned to return to BMA of Takoma Park. You stated that they must respond by September 5th, if they wished to return.

Since BMA of Takoma Park has refused them dialysis treatment with "single use " blood tubing, they have filed both grievances with BMA of Takoma Park, and a lawsuit in United States District Court, challenging BMA's reuse policy. If the matter is resolved in their favor, they intend to return to BMA of Takoma Park. They have not left voluntarily, but have sought treatment elsewhere when they were denied the treatment they considered safest for their health.

Sincerely,

Michael R. Schuster

Michael R. Schuster
Director of Litigation

cc: Peter Lipresti, Esquire
Finley, Kumble, Wagner, Heine,
Underberg, Manley & Casey

American Association of Retired Persons 1909 K Street, N.W., Washington, D.C. 20049 (202) 872-4700
Vita R. Ostrander President Cyril F. Brickfield Executive Director

EXHIBIT "C"

[COMMITTEE STAFF NOTE:]

[The following pages are pertinent excerpts of the full December 13, 1985 inspection report on the BMA Takoma Park facility, originally appended in its entirety to September 8, 1986 letter from Michael R. Schuster, Esq. of the Legal Counsel to the Elderly, American Association of Retired Persons, to Robert J. Taylor, Region III, Division of Health Standards and Quality, Health Care Financing Administration.]

[The complete 26 page inspection report is available to the public through HCFA or the District of Columbia Department of Consumer and Regulatory Affairs.]

[Also, the original letter from Mr. Schuster to Mr. Taylor had an additional attachment, which was excerpts from the District of Columbia's FDA-funded dialysis facility study. Relevant excerpts are included in this staff report in Appendix III.]

DEPARTMENT OF HEALTH AND HUMAN SERVICES
HEALTH CARE FINANCING ADMINISTRATION

FORM APPROVED

STATEMENT OF DEFICIENCIES AND PLAN OF CORRECTION

STATEMENT OF DEFICIENCIES AND PLAN OF CORRECTION	PROVIDER NUMBER 09-2506	MULTIPLE CONSTRUCTION A BUILDING ______ B WING ______	DATE SURVEY COMPLETED 12/13/85
NAME OF PROVIDER OR SUPPLIER BMA Takoma Park	STREET ADDRESS, CITY, STATE, ZIP CODE 247 Carroll Street, N.W., Washington, D. C. 20012		

ID PREFIX TAG	SUMMARY STATEMENT OF DEFICIENCIES (EACH DEFICIENCY SHOULD BE PRECEDED BY FULL REGULATORY OR LSC IDENTIFYING INFORMATION)	ID PREFIX TAG	PROVIDER'S PLAN OF CORRECTION (EACH CORRECTIVE ACTION SHOULD BE CROSS-REFERENCED TO THE APPROPRIATE DEFICIENCY)	COMPLETION DATE
V63	405.2135 (b) Standard: Licensure or Registration of Personnel	V63		
	1. Two members of the facility's governing body are identified as physician co-directors. Copies of their current licenses to practice healing art in the District of Columbia were not available for review.		The two licenses in question have been obtained and are on file. A list of all licensed personnel with expiration dates of licenses has been developed to prevent this problem in the future. See attachment.	1/31/86
	2. A nurse, who worked in the facility until November of 1985, did not have a copy of her current license to practice nursing in the District of Columbia for reviewed Cross reference V83		When the nurse transferred to another unit a copy of her license was not retained by the facility. It has since been returned. See attachment.	1/10/86
V65	405.2136 Condition: Governing Body and Management The facility has a policy stating that "---governing body meets monthly to review all operation of the facility---" On days of survey there was only one governing body meeting minute dated 10/24/85	V65	The BMA Board of Directors has appointed a new Governing Body consisting of the following members: , Administrator; Director of Nursing Services; Medical Director; and Regional Manager. The Governing Body will hold its first meeting on 2/10/86, the agenda of which include the following: 1. Adoption of the Governing Body By-Laws.	2/10/86

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PROVIDER REPRESENTATIVE'S SIGNATURE	TITLE	DATE
Mark J Cronin	ADMINISTRATOR	2/10/86

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1 of 26

*Any deficiency statement ending with an asterisk (*) denotes a deficiency which the institution may be excused from correcting providing it is determined that other safeguards provide sufficient protection to the patients. (See

DEPARTMENT OF HEALTH AND HUMAN SERVICES
HEALTH CARE FINANCING ADMINISTRATION

'ATEMENT OF DEFICIENCIES AND PLAN OF CORRECTION

(X1) PROVIDER 09-2506

A. BUILDING
B. WING

NAME OF PROVIDER OR SUPPLIER

STREET ADDRESS, CITY, STATE, ZIP CODE

ID PREFIX TAG	SUMMARY STATEMENT OF DEFICIENCIES (EACH DEFICIENCY SHOULD BE PRECEDED BY FULL REGULATORY OR LSC IDENTIFYING INFORMATION)	ID PREFIX TAG	PROVIDER'S PLAN OF CORRECTION (EACH CORRECTIVE ACTION SHOULD BE CROSS-REFERENCED TO THE APPROPRIATE DEFICIENCY)	(X5) COMPLETION DATE
	technician, equipment technician, medical maintenance and chief technician. Cross reference V63, V73, V75, V78 and V80		The company has issued new job descriptions for all staff. The position is identified as being the Chief Technician and while it may involve equipment and medical maintenance, he will only be designated as the Chief technician.	RECEIVED SERVICE FACILITY REGULATION ADMINISTRATION FEB 25 11 46 AM '86 2/6/86
V73	405.2136 (d)(2) Cross reference V110, V113	V73	See V113.	RECEIVED SERVICE FACILITY REGULATION ADMINISTRATION FEB 10 1 07 PM '86 2/6/86
V74	405.2136 (d) (2) a The risk management committee of the facility met monthly to review incident and accident reports. The committee, however, did not make any recommendations or steps to prevent the recurrence of similar problems. For examples:	V74	Documentation of bacterial contaminants in water (Form Q-2) indicates that the carbon tank was changed after growth was discovered. Infection Control Committee meeting minutes also indicate plan of action. In the future, minutes of meetings will go into more detail. See attachment.	
	1. For three consecutive months from May to July of 1985, there were positive culture of pseudomonas and bacteria in the water treatment system and the central delivery system. There was no information available for review		Documentation of the chief tech's completion of a technical training program is attached. This program includes sterilization techniques and culture sampling.	12/8/85

PROVIDER REPRESENTATIVE'S SIGNATURE Mark J Casner

TITLE ADMINISTRATOR

(X6) DATE 2/14/86

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Any deficiency statement ending with an asterisk (*) denotes a deficiency which the institution may be excused from correcting providing it is determined that other safeguards provide sufficient protection to the patients. (See

DEPARTMENT OF HEALTH AND HUMAN SERVICES
HEALTH CARE FINANCING ADMINISTRATION

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ATEMENT OF DEFICIENCIES AND PLAN OF CORRECTION

(X1) PROVIDER NUMBER 12/13/85

(X2) MULTIPLE CONSTRUCTION
A. BUILDING
B. WING

(X3) DATE SURVEY COMPLETED 12/13/85

NAME OF PROVIDER OR SUPPLIER

STREET ADDRESS, CITY, STATE, ZIP CODE

ID PREFIX TAG	SUMMARY STATEMENT OF DEFICIENCIES (EACH DEFICIENCY SHOULD BE PRECEDED BY FULL REGULATORY OR LSC IDENTIFYING INFORMATION)	ID PREFIX TAG	PROVIDER'S PLAN OF CORRECTION (EACH CORRECTIVE ACTION SHOULD BE CROSS-REFERENCED TO THE APPROPRIATE DEFICIENCY)	(X5) COMPLETION DATE
	to indicate the equipment staff were provided inservices on the proper techniques in performing sterilization and in taking culture samples of the system.			
	2. There were several incidents in which patients were dialyzed with other patients' reprocessed dialyzers and blood tubings. There was a lack of evidence to indicate that staff were provided inservices regarding the requirement to comply with the facility's policy and procedures, i.e., to check the dialyzer and blood tubing for correct identification prior to the initiation of dialysis treatment. Staff were observed putting patients on for dialysis treatments without checking either the dialyzers or the blood tubings for proper identification.		The staff members involved in these three incidents were disciplined per union contract disciplinary guidelines. All staff members were informed of the incidents and the facility policies were reinforced on 2/20/86. An inservice on patient care policies has been placed on the 1986 inservice schedule. See attachements.	2/6/86
	Cross reference V111, V186			

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PROVIDER REPRESENTATIVE'S SIGNATURE Mark J Casner

TITLE ADMINISTRATOR

(X6) DATE 2/19/86

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Any deficiency statement ending with an asterisk (*) denotes a deficiency which the institution may be excused from correcting providing it is determined that other safeguards provide sufficient protection to the patients. (See

TATEMENT OF DEFICIENCIES AND PLAN OF CORRECTION

09-2506

A. BUILDING ______

B. WING ______

12/13/85

ID PREFIX TAG	SUMMARY STATEMENT OF DEFICIENCIES (EACH DEFICIENCY SHOULD BE PRECEDED BY FULL REGULATORY OR LSC IDENTIFYING INFORMATION)	ID PREFIX TAG	PROVIDER'S PLAN OF CORRECTION (EACH CORRECTIVE ACTION SHOULD BE CROSS-REFERENCED TO THE APPROPRIATE DEFICIENCY)	COMPLETION DATE
	3. An employee lacked annual VDRL test result in file.		CONT. When she was hired as a fulltime employee in July of 1985, she had the required testing performed. See attachment All employees had current VDRLs on file at the time of the survey. See attachment.	2/6/86
V80	405.2136 (d) (6) Though the facility provided inservices to its staff on a regular basis, inservices were not provided according to the needs of the staff in the facility. For examples: there were no inservices on compliance with the facility's policies in putting patients on dialysis treatment, i.e., check for proper identification of the reprocessed dialyzers and blood tubings, perform and verify the results of schiff's tests with two staff prior to initiation of the dialysis treatment. There was also a lack of inservices for the equipment staff regarding proper sterilization and culture sample techniques. Problems such as patients were dialysed with wrong dialyzers and wrong blood tubings and pseudmonas infestation of the water treatment system were documented in the incident reports. Cross reference V74, V11, V186	V80	All of the inservice topics mentioned have been included on the inservice schedule for 1986. See attached. The following inservices have been held in 1986. See attached.	2/6/86 2/10/86

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TITLE ADMINISTRATOR

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DEPARTMENT OF HEALTH AND HUMAN SERVICES
HEALTH CARE FINANCING ADMINISTRATION

STATEMENT OF DEFICIENCIES AND PLAN OF CORRECTION

PROVIDER NUMBER 09-2506	MULTIPLE CONSTRUCTION A. BUILDING B. WING	DATE SURVEY COMPLETED 12/13/85	
NAME OF PROVIDER OR SUPPLIER	STREET ADDRESS, CITY, STATE, ZIP CODE		

ID PREFIX TAG	SUMMARY STATEMENT OF DEFICIENCIES (EACH DEFICIENCY SHOULD BE PRECEDED BY FULL REGULATORY OR LSC IDENTIFYING INFORMATION)	ID PREFIX TAG	PROVIDER'S PLAN OF CORRECTION (EACH CORRECTIVE ACTION SHOULD BE CROSS-REFERENCED TO THE APPROPRIATE DEFICIENCY)	COMPLETION DATE
	13. Physicians did not always provide legible signatures with titles when making entries in patients' medical records. Cross reference V89, V90, V98, V159, and V161	V83	See V83, No. 11	2/5/86
V85	405.2136 (g)(1) Cross reference V83, V88, V89, V90, V93		See V83, V89, V90, V93	
V88	405.2137 Condition: Patient Long-Term Program and Patient Care Plan Cross reference V89, V90 and V93	V88	See V89, V90, V93	
V89	405.2137 (a) Standard: Patient Long-Term Program Five of the seven active and three of the eight discharged medical records reviewed were for patients who were admited after February 1985. There was no long-term	V89	Long term care plans have been developed for the patients mentioned. See attached.	12/31/85

PROVIDER REPRESENTATIVE'S SIGNATURE Mark J Cramer	TITLE ADMINISTRATOR	DATE 2/14/86

Any deficiency statement ending with an asterisk (*) denotes a deficiency which the institution may be excused from correcting providing it is determined that other safeguards provide sufficient protection to the patients. (See

TATEMENT OF DEFICIENCIES AND PLAN OF CORRECTION

09-2506

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	programs developed for these patients. In these records, there were "transfer patient care plan." The facility uses thes "transfer patient care plans" in lieu of long-term programs. The information on the "transfer patient care plan" included patient's treatment modality, who and where the information was taken from and by whom and physician's authorization. There was no evidence in the plans or in the records to indicate the dietitian and social worker had inputs in the formulation of the plans and that the plans were developed with patients participation. Furthermore, the transfer progress notes from hospitals did not have any information to support that the plans were established with patients' participation. The notes available for review were only dialysis treatment information in the hospital. Dietitian did not have any nutritional informaton of patients in the long-term programs. The	V89	A new long term care plan has been developed which will require more nutritional information. See attachment	2/6/86

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ATEMENT OF DEFICIENCIES AND PLAN OF CORRECTION

09-2506

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	information provided by the dietitian for patients who have been in the facility for more than a year were: "Patient is not a transplant candidate."			
V90	405.2137 (b) Standard: Patient Care Plan Care plans for newly diagnosed end-stage renal disease patients were not reviewed and updated by the interdisciplinary team monthly. In addition, care plans were not developed in a format that can be understood and followed by the patients. There was no educational components included for problems identified in all plans reviewed tb promote self-care and idenpendency of patients. Samples of patiant care plans are as follows: a. Problem: ESRD Plan/Goal: Hemodialysis 3 times per week, 4 hours. b. Problem: Diabetes (by history) Plan/Goal: Insulin dependent;	V90	Care plan meetings will be held on a monthly basis to update the care plans of new ESRD patients and/or unstable patients. New short term care plans have been drafted which allow for monthly discussion of problems. Care plans will be completely rewritten semi-annually to allow for addition of new problems and deletion of resolved problems. See attached.	2/10/86

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Mark S Cason

TITLE ADMINISTRATOR

DATE 2/10/86

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DEPARTMENT OF HEALTH AND HUMAN SERVICES
HEALTH CARE FINANCING ADMINISTRATION

FORM APPROVED
OMB No. [illegible]

STATEMENT OF DEFICIENCIES AND PLAN OF CORRECTION	(X1) PROVIDER NUMBER 09-2506	(X2) MULTIPLE CONSTRUCTION A. BUILDING ____ B. WING ____	(X3) DATE SURVEY COMPLETED 12/13/85
NAME OF PROVIDER OR SUPPLIER	STREET ADDRESS, CITY, STATE, ZIP CODE		

(X4) ID PREFIX TAG	SUMMARY STATEMENT OF DEFICIENCIES (EACH DEFICIENCY SHOULD BE PRECEDED BY FULL REGULATORY OR LSC IDENTIFYING INFORMATION)	ID PREFIX TAG	PROVIDER'S PLAN OF CORRECTION (EACH CORRECTIVE ACTION SHOULD BE CROSS-REFERENCED TO THE APPROPRIATE DEFICIENCY)	(X5) COMPLETION DATE
V98	405.2139 (a) Standard: Medical Record The staff of the facility did not record complications experienced by patients in the patient's medical record. On 12/12/85, a patient was found to have prolonged bleeding at the completion of dialysis treatment at 3:15 p.m. At the time when the surveyors left the facility at 4:45 p.m., the patient continued to have problem bleeding. Blood pressure of this patient on the dialysis flow sheet was last recorded at 2 p.m. On 12/13/85, this patient's medical record was reviewed. There was no progress note from the nurse to indicate when the patient left the unit and what would be done about the bleeding problem. The only information on the dialysis flow sheet available for review was as follow: "Offers no complaints. Patient tolerated treatment well. Left unit stable." The ACT of this patient was last checked in October 1985. Cross reference V83, V89, V90, V159, V161	V98	Inservices were held the week of 2/3/86 for all staff with regard to documentation. With regard to the incident in question, the ACT's were checked on 12/14/85 and 12/17/85. See attached.	2/7/86

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PROVIDER REPRESENTATIVE'S SIGNATURE Mark J Casner	TITLE ADMINISTRATOR	(X6) DATE 2/10/86

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*Any deficiency statement ending with an asterisk (*) denotes a deficiency which the institution may be excused from correcting providing it is determined that other safeguards provide sufficient protection to the patients. (See [illegible]

DEPARTMENT OF HEALTH AND HUMAN SERVICES
HEALTH CARE FINANCING ADMINISTRATION

STATEMENT OF DEFICIENCIES AND PLAN OF CORRECTION

(X1) PROVIDER NUMBER: 09-2506

(X2) MULTIPLE CONSTRUCTION
A. BUILDING ____
B. WING ____

(X3) DATE SURVEY COMPLETED: 12/13/85

NAME OF PROVIDER OR SUPPLIER

STREET ADDRESS, CITY, STATE, ZIP CODE

(X4) ID PREFIX TAG	SUMMARY STATEMENT OF DEFICIENCIES (EACH DEFICIENCY SHOULD BE PRECEDED BY FULL REGULATORY OR LSC IDENTIFYING INFORMATION)	ID PREFIX TAG	PROVIDER'S PLAN OF CORRECTION (EACH CORRECTIVE ACTION SHOULD BE CROSS-REFERENCED TO THE APPROPRIATE DEFICIENCY)	(X5) COMPLETION DATE
	make it very difficult for one or more than one person to move freely in an emergency.			RECEIVED SERVICE FACILITY REGULATION ADMINISTRATION FEB 10 1 09 PM '86
	Cross reference V110, V111			
V111	405.2140 (a)(5)	V111	See V74	
	Several monthly water cultures showed bacteria growth too numerous to count for pseudomas acrugenosa. Although a new carbon tank was installed the problem persisted. The facility has not adequately investigated the problem, so as to be able to take the necessary corrective action.			
V112	405.2140 (b) Standard: Favorable environment for patients			
	Cross reference V113, V186			
V113	405.2140 (b)(1)			
	1. There was accumulated dirt and spillage on the floor throughout the premises, mainly at the baseboard, at the base of cabinets and other fixtures.	V113	1) The cleaning service was notified of the fact that they are not performing services as stated in their contract. Corrective action is being taken	2/3/86

PROVIDER REPRESENTATIVE'S SIGNATURE: Mark J Cremer

TITLE: ADMINISTRATOR

(X6) DATE: 2/10/86

Any deficiency statement ending with an asterisk (*) denotes a deficiency which the institution may be excused from correcting providing it is determined that other safeguards provide sufficient protection to the patients. (See reverse for further instructions.) The findings above are disclosable 90 days following [illegible]

DEPARTMENT OF HEALTH AND HUMAN SERVICES
HEALTH CARE FINANCING ADMINISTRATION

STATEMENT OF DEFICIENCIES AND PLAN OF CORRECTION

(X1) PROVIDER NUMBER: 09-2506

(X2) MULTIPLE CONSTRUCTION
A. BUILDING ____
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(X3) DATE SURVEY COMPLETED: 12/13/85

NAME OF PROVIDER OR SUPPLIER

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	2. The wheels and base of the dialysis machines were not maintained free from dirt and spillage.	V113	2)See V113 No.1	
	3. The bottom portion of two of the dialysis units were in disrepair.		3)The bottom portions of the two units were repaired.	2/6/86
	4. Attending physicians did not gown or wash their hands when coming on the unit giving care to the patients.		4)See V83 #11. Physicians will be required to gown and wash their hands. A letter was sent to each physician and lab coats have been ordered.	2/1
V186	405.2140 (b)(6)			
	1. The water softener was leaking on the first day of the survey. Softener was replaced the following day.	V186	1)The water softener was repaired in a timely fashion.	12/85
	2. On the first day of survey, examination of two sets of reprocessed dialyzers and blood tubings revealed that there were brownish color fluid. It can not be determined whether the fluid in the tubing was formaldehyde which usually has a bluish tinted appearance.		2)Dialyzers are now checked prior to delivery in the treatment room. If brownish fluid appears the dialyzers are reprocessed and a new wet-pack dialyzer is used for the treatment that day. See attached.	2/6/86

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PROVIDER REPRESENTATIVE'S SIGNATURE: Mark J Casner

TITLE: ADMINISTRATOR

(X6) DATE: 2/10/86

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DEPARTMENT OF HEALTH AND HUMAN SERVICES
HEALTH CARE FINANCING ADMINISTRATION

FORM APPROVED
OMB No. [illegible]

STATEMENT OF DEFICIENCIES AND PLAN OF CORRECTION	(X1) PROVIDER NUMBER 09-2506	(X2) MULTIPLE CONSTRUCTION A. BUILDING B. WING	(X3) DATE SURVEY COMPLETED 12/13/85
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	3. The filter for the air purifier was not on the preventive maintenance schedule and as such filter was excessively dirty. Filter replaced during the survey..	V106	A preventive maintenance schedule has been established for the air purifier filter.	12/20/85
	4. Facility's policy states that "formaliar measuring equipment should be placed head high." The equipment was placed above the head or waist high for testing.		Shelf for measurement of formaldehyde levels has been lowered to the correct height	2/7/86
	5. In reviewing the accident/ incident reported several occurrences of incorrect dialyzer and tubing were noted. Nevertheless, the facility's policy of verifying dialyzer and tubing before initiation of treatment was not consistently performed by staff.		See V74 No. 2	
	6. The facility's policy on residual Formaldehyde Tests states that "the Schiffs test is to be validated by a second person. During the survey, staff was observed not routinely validating the Schiffs Test.		See V80. In addition, the hemo sheets have been audited and the staff member identified and disciplined. See attached	2/5/86

PROVIDER REPRESENTATIVE'S SIGNATURE Mark J Casner	TITLE ADMINISTRATOR	(X6) DATE 2/10/86

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Any deficiency statement ending with an asterisk (*) denotes a deficiency which the institution may be excused from correcting providing it is determined that other safeguards provide sufficient protection to the patients. (See reverse for further instructions.) The findings above are disclosable 90 days following the date of survey whether or not a plan of correction is provided. If deficiencies are cited, an approved plan of correction is requisite to

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